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# THE BULLETIN

OF THE



AMERICAN SOCIETY OF HOSPITAL PHARMACISTS  
VOLUME 4 NUMBER 6



THE BULLETIN  
OF THE



THE BULLETIN is published bimonthly by the American Society of Hospital Pharmacists, a national organization devoted to the profession of hospital pharmacy, dedicated to the interests of the hospital pharmacist, and pledged to co-operate with the American Pharmaceutical Association with which it is affiliated.

Contributions of articles by hospital pharmacists, or by others interested in the progress of this important branch of the public health profession, will be accepted if they are of general interest to the hospital pharmacist. The editors reserve the right to revise all material submitted, if necessary.

Manuscripts submitted for publication should be typewritten in double spacing on one side of paper 8 1/2 x 11". Whenever possible a photograph, drawing, or printed form to illustrate the topic that is discussed in the article should be included.

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## CORRESPONDENCE

Dear Sirs: Taking notice of the formula published in the May-June BULLETIN, I am submitting a formula which has met with complete satisfaction with the eye specialist and patient over a period of five years. The preparation is stable, its therapeutic action and color is constant over a period of six months; at the end of this period there has been noted "no change whatever".

In the use of Sodium Formaldehyde Sulfoxylate there is the possibility of sclerosis of the membranous tissues of the retina and conjunctiva, with particular emphasis in glaucoma cases.

Buffered solutions and alkaline media, as well as boric acid will produce a change within several days. Following is the recommended formula:

Physostigmine Salicylate	1%
Benzoic Acid Solution 1:300	50%
Recently Distilled Water	49%
Mix, make solution and filter.	

It has been my experience with preserved water, that it does not prevent color change.

C.H.F. Lembke

135 West Glenaven Avenue  
Youngstown 7, Ohio

Dear Sirs: Please accept the enclosed check as our contribution to help defray the expense of the publishing of THE BULLETIN of the American Society of Hospital Pharmacists.

As a retail pharmacist I want to compliment you on the fine work you are doing in publishing this bulletin and I hope that you will find more financial support to carry on this excellent job.

May I also add my well wishes for the continued success of this progressive organization.

A. J. Meyer

16239 Mack Avenue  
Detroit 24, Michigan

To prescription pharmacist A. J. Meyer a hundred thanks for his welcome gift of an equal number of dollars. For his sincere interest in the Society and the work it is trying to accomplish, we are also grateful.

EDITOR

Dear Sirs: We have noted with considerable interest the article on Bacitracin, which is published in your September-October number. Believing that this would be of interest to our readers, who are Latin American pharmacists, we wonder if we might have permission to translate this into Spanish and reprint it in LA FARMACIA MODERNA.

Credit would, of course, be given to THE BULLETIN of the American Society of Hospital Pharmacists.

We are enclosing a copy of LA FARMACIA MODERNA for you to look over.

May we hear from you soon?

Charless Hahn

La Farmacia Moderna  
Chicago 6, Illinois

Dear Sirs: I have just received the September-October issue of THE BULLETIN. I want to assure you this is one of the most useful journals coming to my attention.

Bernard A. Bialk

University of Arizona School of Pharmacy  
Tucson, Arizona

Dear Sirs: Through Mr. W. Paul Briggs, Chief of Pharmacy Bureau, Veterans Administration, Washington, D. C., I was fortunate to be able to read your excellent article on "Isopropyl Alcohol" in your July-August edition.

It would be very much appreciated if you could forward to me one dozen copies of this article. I will gladly forward any pecuniary attachments.

I am with the Chemical Products Department of Standard Oil Company of New Jersey which is known as the Enjay Company, Inc. and which is one of the three manufacturers of isopropyl alcohol.

If this request is granted, please mail to address shown on attached card.

Thank you kindly.

Robert M. Short

Enjay Company, Inc.  
New York City, New York





## HOSPITAL PHARMACY SURVEY

## EDITORIAL

Those of us in hospital pharmacy constantly hear the terms "justification" and "policy". It seems that, whether we like it or not, these are important concepts for all hospital administrators. Since they are important and are used everyday in all hospitals, we too should learn to use them to our advantage and not regard them as barriers to progress.

What determines "justification" for increased personnel, for better wages, for new equipment, for including the pharmacist as a member of the therapeutics committee, for the preparation of special products? Admittedly many factors are involved but a common denominator is, "what is the accepted practice in the better hospitals of the country"? Now, admittedly all the better hospitals of the country do not, in all respects, follow practices we would want to emulate. However, to make our job of justification easier we must have some basis on which to judge, we must know the trend in pharmaceutical service, we must be able to justify our recommendations for the improvement of our own department and its service.

What determines "policy" for the forty hour week in pharmacy, for the dispensing of prescriptions, charges for medication to patients, physicians, hospital personnel, and other units of the hospital; for the pharmacist being solely responsible for the purchase of drugs, for the all-inclusive rate for medications? Again, many factors are involved and they differ from hospital to hospital but still there remains the common factor of accepted practice.

Most of us know the accepted practice of only a few hospitals. To plan constructively for the future; our future and that of our department, we must know more. To be sure, "justification" and "policy" are closely allied and at times one is used as the basis of the other. But the fact still remains that we must have a foundation for our recommendations.

One set of data we may all use to our advantage is the results of the SURVEY OF HOSPITAL PHARMACY now being collated by Herbert L. Flack, editor of the Hospital Pharmacy Forum

of the American Professional Pharmacist. This survey has been sent to several thousand hospital pharmacists. A great deal of thought and effort has been put into compiling the questions. Not very much work is necessary to answer them. But, to date, the number of replies received has not been encouraging.

Those of us who bemoan our inadequate space, poor equipment, low pay, lack of sufficient personnel, and professional responsibility are perpetuating these conditions when we fail to bear a small measure of responsibility and supply answers to questions which must be answered before hospital pharmacy can progress.

It is our understanding that the results of this survey will be made available to the Division of Hospital Pharmacy. This will be a help to the Division in inaugurating its own surveys. For when the Division of Hospital Pharmacy is activated, it will undoubtedly carry out several surveys within the next few years in an effort to find the answers to the many questions now confronting the specialty of hospital pharmacy. There is bound to be duplication in the surveys. This is necessary and probably desirable since the replies will tend either to contradict or to corroborate those in the first survey, thus confirming the first findings, or showing a new trend in hospital pharmacy.

We urge you to do your bit for the advancement of our profession by completing the questionnaire you have received and sending it to the American Professional Pharmacist. And remember, when you do receive requests for information from the Division of Hospital Pharmacy, be sure to make the answers meaningful through your cooperation. There is nothing more discouraging than to attempt to move a profession forward and then to learn that the individuals comprising the profession are not willing to make any contribution. Any survey, to be meaningful, must represent a cross-section of hospital pharmacy. You represent an important unit of your specialty. Let's all unite and cooperate for a better hospital pharmacy.

# urea peroxide

BY EUGENE S. WEAVER, SENIOR PHARMACIST  
UNIVERSITY HOSPITAL, ANN ARBOR, MICHIGAN

Although peroxide compounds first made their appearance about 150 years ago, it is only recently that urea peroxide has found therapeutic applications. Since early in the nineteenth century when the French pharmacist, Thenard, discovered hydrogen peroxide, many attempts have been made to produce peroxide solutions of greater stability and to control their rate of decomposition. It has been found that a solution of urea peroxide in glycerin forms a stable solution which slowly releases oxygen when placed in contact with moist body surfaces.

## CHEMICAL AND PHYSICAL PROPERTIES

Urea peroxide (carbamide peroxide, carbonyl diamide peroxide, urea hydrogen peroxide, perhydrit is a molecular compound formed by urea and hydrogen peroxide. It has the formula  $\text{CO}(\text{NH}_2)_2 \cdot \text{H}_2\text{O}_2$  and has a molecular weight of 94.06. Urea peroxide contains a minimum of 34% by weight of  $\text{H}_2\text{O}_2$ , equivalent to 16% by weight of active oxygen. Urea peroxide melts with decomposition at  $75^\circ$  to  $85^\circ$  C. It occurs as a white crystalline solid and has a pH of 2.6 (saturated solution at  $20^\circ$  C.). It is soluble in water to the extent of 46% at  $20^\circ$  C. In organic solvents it is only about half as soluble as it is in water.

Urea peroxide is quite stable when protected from heat and moisture and can be stored without loss for long periods of time. However, in the presence of heat and moisture, or certain catalysts (principally heavy metals) it decomposes rapidly. Anhydrous solutions in ether, acetone and similar solvents, are explosive under certain conditions.<sup>6</sup>

Aqueous solutions of urea peroxide rapidly deteriorate. A 10 per cent solution of urea peroxide in distilled water is stable for about ten days; thereafter it very rapidly deteriorates, the reaction being self-accelerating. However, solutions in glycerin, ethylene glycol and isopropanol show a stability superior in some respects to that of crystalline urea peroxide. The glycerin solution is most stable of the three solutions mentioned and liberates oxygen more slowly

and regularly. It also tolerates some moisture (4.5 to 9 per cent) without appreciable effect on stability.<sup>2</sup> Urea peroxide has the advantage over the more commonly used zinc peroxide that it need undergo no activation in order to release its oxygen.<sup>1</sup> However, the fact that it decomposes at a low temperature indicates that it cannot be sterilized as can zinc peroxide. This solution has other advantages from the therapeutic standpoint which will be discussed elsewhere.

Brown and his associates developed a solution consisting of urea peroxide 4% (representing hydrogen peroxide 1.5%) in substantially anhydrous glycerin with 8-hydroxyquinoline 0.1% added as a secondary stabilizing agent. This preparation was given the name "Thenardol" in honor of the discoverer of hydrogen peroxide. The 8-hydroxyquinoline combines with the heavy metals that usually occur as impurities in glycerin. These trace elements, although harmless in themselves, act as catalysts and tend to inactivate the hydrogen peroxide.<sup>3,6</sup>

Urea peroxide decomposes in the presence of water breaking down into urea and hydrogen peroxide. Glycerin acts as a stabilizer for the urea peroxide and prolongs its action.<sup>3</sup> A proprietary product prepared according to Brown's formula is now available from the International Pharmaceutical Corporation, Boston, Massachusetts. The commercial name is "Glycerite of Hydrogen Peroxide with Carbamide".

## THERAPEUTIC APPLICATIONS

The therapeutic value of urea peroxide is due to one of its decomposition products, hydrogen peroxide. Theoretically, hydrogen peroxide is an ideal antiseptic because it is bactericidal in dilutions that are harmless to normal tissues.<sup>3</sup> Peroxides in general are effective against a wide range of anaerobic and micro-aerophilic organisms.<sup>1</sup> Peroxides have been used with good results in the treatment of gas-gangrene, tetanus, infections of the middle ear, Vincent's disease and some fungous and virus infections.<sup>2,3,5</sup>

Aqueous hydrogen peroxide has several faults.

It is too unstable and its action too transient. In addition, the water present may cause skin maceration.<sup>3</sup>

Reid and Altemeier working in collaboration with the research division of the William S. Merrell Company developed a Carbowax ointment base for use with peroxides.<sup>1</sup> This base contains no water and absorbs none on standing. It has a melting point of 38° to 39° C. Clinical investigation was done using a 10% zinc peroxide ointment and a 3% urea peroxide ointment made in this base.

#### CARBOWAX BASE FOR PEROXIDES

Carbowax 1540	120 Gms.
Nonethylene Glycol-polyethylene Glycol 400	80 cc.

These were melted together and the peroxide added when the solution had cooled somewhat. It was concluded that zinc peroxide was the more satisfactory even though it left an insoluble residue in the wound. Urea peroxide left no such residue and the urea was of value in removing necrotic tissue. Urea peroxide also seemed to have a synergistic effect on sulfonamides. Even so, urea peroxide was considered to have three disadvantages: (1) It is irritating to the wound due to its low pH. (2) It markedly delays wound healing with continued use. (3) Its release of oxygen is too sudden and of too short duration. This latter property does make it of value as a prophylactic against lewisite burns.<sup>1</sup>

Brown and his co-workers used substantially anhydrous glycerin as a vehicle with 8-hydroxyquinoline as a secondary stabilizer. Glycerin not only stabilizes the urea peroxide but its surface tension confines the liberated oxygen to the solution and prolongs its action. As the oxygen is evolved, it churns the glycerin to a cream which possesses the properties of both liquid and ointment types of medication. Being hygroscopic, glycerin draws plasma from the deeper parts of the lesion. This causes the bacteria to be washed to a level where they may more readily be acted upon by the antiseptic. Although 8-hydroxyquinoline is in itself a good antiseptic, its action, along with that of the glycerin and urea, is secondary to that of hydrogen peroxide.<sup>3,5</sup> The fact that glycerin does not dry makes it an ideal vehicle for wet dressings and its viscosity keeps it in place. When used for an extended period of time it may have a dehydrating effect on tissues but this effect is much less than that of the antiseptic tinctures.<sup>3</sup>

The antiseptic properties of glycerite of hydrogen peroxide approach those of tincture of

iodine and, in addition, the solution is non-toxic, non-allergenic and non-irritating.<sup>3</sup> It is more effective against gram-positive organisms than mercurial antiseptics although the reverse is true in the case of gram-negative organisms.<sup>4</sup> It is ineffective against warts, solar dermatitis, and psoriasis and has caused irritation in some cases of barber's itch and sensitization dermatitis.<sup>5</sup>

#### FORMULATION

A satisfactory preparation of urea peroxide in glycerin may be prepared according to the following formula:

Urea Peroxide	4.0 Gms.
8-Hydroxyquinoline	0.1 Gm.
Anhydrous Glycerin, to make	100.0 cc.

Dissolve the 8-hydroxyquinoline in warm glycerin. Cool, then dissolve the urea peroxide.

A similar solution may be prepared using 1.5 to 2.5 per cent of 92% hydrogen peroxide in place of urea peroxide. The antiseptic properties of this preparation are not significantly different from those of the urea peroxide solution.<sup>7</sup>

#### ANHYDROUS GLYCERIN

Glycerin U.S.P. may be used in this preparation although, since it may contain as much as 5 per cent water, a more stable product will be obtained by using anhydrous glycerin.

An essentially anhydrous glycerin may be obtained by heating U.S.P. glycerin at 150° C. for one to two hours, allowing the moisture to escape. The boiling point of glycerin is 290° C. so decomposition will not take place. This procedure not only removes the moisture but also sterilizes the glycerin.

A sample of glycerin C.P. taken from a 50 pound container was heated in this laboratory to determine its moisture content. When heated for 4 hours at from 190 to 200° C. the sample was found to contain 2.1 per cent of water. Thus, it is probable that, for all practical purposes, a satisfactory solution of urea peroxide in glycerin may be prepared for extemporaneous use utilizing the commercially available C.P. grade glycerin.

Urea peroxide may be purchased in dry form from the Buffalo-Electro-Chemical Company, Incorporated, Buffalo, New York. It should be stored in a cool, dry place.



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# KHELLIN

by

WANDA J. BUTLER, B.S., M.S.\*

AN ANTISPASMODIC AGENT FROM THE FOLK-MEDICINE OF EGYPT

For centuries, extracts of Ammi Visnaga have been used by the Egyptians as an antispasmodic in renal colic and in ureteral spasm. Ammi Visnaga is an umbelliferous plant indigenous to the shores of the Eastern Mediterranean, and readily accessible to the natives. An attempt was made to grow the plant in the United States<sup>1</sup> but the trial proved unsuccessful. A decoction of the fruits had been employed to such an extent that following early reports as to its efficiency in renal colic, a 1:40 decoction and a 1:10 tincture became official in the Egyptian pharmacopoeia in 1934.

Ammi is known under several names of the lay-persons in Egypt, among which are "Khella", "Gazar Shitani", and "Bisr-El-Khelle"<sup>1</sup>. Of interest recently was the announcement by several members of the faculty of the Fuad I University Medical School at Cairo<sup>2</sup> that an active constituent has been employed in pure form in the treatment of bronchial asthma and in angina.

\*Acting Head, Department Pharmaceutical Chemistry, Creighton University College of Pharmacy; formerly Pharmacist, Grace-New Haven Community Hospital, New Haven, Conn.

## ACTIVE PRINCIPLES

Prior to the early part of the thirties, very little information was available concerning the active constituents of the plant, at this time considerable research was done<sup>3</sup>. Until this time the only recorded investigational literature was that of Mustapha<sup>4</sup> who had isolated from the plant a crystalline substance of definite glucosidal properties. Outside of determining the glucosidal nature of the substance no definite conclusions could be drawn as to the chemistry of the material, since there was no indication as to whether a mixture was obtained. A few years later Malosse<sup>5</sup> made more progress in isolating several principles, which he named alpha, N-beta, gamma Visnagen. The three isolated constituents possessed glucosidal properties, and showed activity as a smooth muscle relaxant. Malosse's work clearly indicated the presence of more than one constituent, but it was not until 1930 that investigation revealed the number, properties and chemistry of the constituents<sup>6</sup>.

In this later investigation more substantial and accurate information was made available to indicate the possibility of six constituents<sup>6</sup>, all of which were glucosidal in nature, and showed some action as antispasmodics. The six gluco-

sidal components were separated and named Visammin, Visamidin, Visagidin, Khellinin, Khellidin, and Visnagen. Of these isolated principles Visammin (which is now called "Khellin", and shall be referred to as such in this article), showed activity as a smooth muscle relaxant. It was obtained in a pure form, so that a melting point determination indicated the absence of other compounds and impurities<sup>6</sup>. Khellinin, another of the six components isolated, was investigated, its pharmacological action determined, and its possible chemical structure formulated. Both Khellin and Khellinin possessed similar properties and pharmacological action. A comparative table as to properties and action of Khellin and Khellinin is presented below.

It is evident from the above table that both constituents possess similarity in chemistry and pharmacology. Further investigations upon Ammi Visnaga with isolation and purification of Khellinin may reveal that it too, may be employed in much the same manner as is Khellin.

### STANDARDIZATION

A standardization of the purified Khellin was based upon the depth of color obtained when a dilute solution of the crystalline material was treated with alkali<sup>2</sup>. Solutions of Khellin in contact with a potassium hydroxide solution will produce a definite pink color within in ten minutes, which will last for several hours. The method is described below.

### Standardization of Khellin Solutions (2)

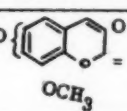
1. Standard stock solution  
Khellin, M.P. 153' C., 25 mg per 100cc water
2. Saturated solution of potassium hydroxide
3. Unknown sample  
Sample is dissolved in water, one cubic centimeter of which is diluted to 200cc with water.

#### Method:

Five cc. of saturated solution of potassium hydroxide are placed into each of five test tubes. A sufficient quantity of the standard stock solution of Khellin is added to each of the test tubes, so that the following amounts of Khellin are presented in each tube:

0.05 mg, 0.1 mg, 0.15 mg, 0.2 mg, 0.25 mg  
Of the solution of unknown dilution, 0.2 cc is added to 5 cc of saturated solution of potassium hydroxide in another test tube. The production of a pink color occurs within ten minutes. Comparison of the unknown sample to the colors produced in the standard known tubes gives an accurate method for standardization of the material. The matching of the colors may be done either with a colorimeter or with the naked eye.

Particular stress is made in using as pure a material as possible. The authors warn of the materials available which may cause untoward side-effects<sup>2</sup>.

Khellin (Visammin) <sup>2,6</sup>	% of seed	Khellinin <sup>7</sup>
0.31%		0.38%
C <sub>14</sub> H <sub>12</sub> O <sub>5</sub>	Empirical Formula	C <sub>19</sub> H <sub>20</sub> O <sub>10</sub> ·2H <sub>2</sub> O
di-methoxy-furano-chromone; possible relationship to the flavones, coumarins. (structure not established)	Structural Formula	C <sub>3</sub> H <sub>4</sub> O {  C <sub>6</sub> H <sub>11</sub> O <sub>5</sub> OCH <sub>3</sub>
153' C. coronary	Melting Point	175' C.
Potent/vasodilator; acts directly upon the heart muscles; exerts no general effects upon blood pressure.	Action on Heart	Acts directly upon the heart muscles; dilates the coronary arteries slightly; gives more complete systole and diastole.
Relaxes all smooth muscle	Action on Smooth Muscle	Relaxes smooth muscle
Dilation of bronchi	Action on Respiratory Passages	Dilation of bronchi
Low toxicity	Toxicity	Low toxicity



## ACTIONS AND USES

In general the purified glucoside Khellin possess actions similar to the crude extracts which have been used empirically for a number of centuries. Except for the fact that solutions of the purified derivative may be used parenterally, the actions today are the same, with newer applications. Khellin causes a complete and long relaxation of the visceral unstriated muscles, i.e. of the intestines, the uterus, bile ducts, the bronchi and especially of the ureters. In 1945 it was shown to have a potent coronary vasodilator effect<sup>8</sup> and its reported successful trial in angina is noteworthy<sup>2</sup>. In 1932 Khellin was shown to be effective in dilation of the respiratory passages<sup>6</sup> hence the rationale for its clinical trial in bronchial asthma.

In 150 angina cases, single or repeated doses of 100 milligrams, administered intramuscularly; or doses of 50 to 100 mg given orally gave extremely encouraging results. The drug acted directly upon the heart muscles,<sup>2,3</sup> and caused more complete diastole and systole, without increasing the oxygen requirements of the heart. Khellin caused the cardiac arteries to become dilated, with hardly any change in the heart rate. The general blood pressure was unchanged.

In patients affected with bronchial asthma, forty-one out of forty-five experienced prolonged relief within 15 minutes after intramuscular administration of doses from 200-300 mg. If given orally for asthma, a sufficiently high dosage was given three times a day to allow prolonged relief from symptoms. In comparison to ephedrine, Khellin did not give as prompt relief, but it was effective for a greater period of time. Since the general blood pressure was not affected Khellin could be more safely administered to hypertensive patients. Khellin was found to be effective in those cases resistant to epinephrine and aminophyllin. In all cases the respiratory

rate increased, and the vital capacity increased from 600-1000 cc.

In comparison with atropine, Khellin has practically no toxic symptoms. The comparative table for the actions of each is presented below.

The administration of the pure crystalline Khellin causes few side-effects, if the recommended dosages are given. Overdosage may cause a feeling of warmth, without flushing, vertigo and nausea. These reactions usually disappear within a short time. The use of non-purified, non-standardized preparations caused severe oliguria when administered parenterally, and upon oral administration produced gastric irritation and nausea.

As far as is known Khellin is not available in the United States. It has been extensively investigated and purified by the Faculty of Medicine, Fuad I University, Cairo, Egypt. It is highly probable that some of the material may be obtained from this source.

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Comparative Table of Action

Khellin		Atropine (9, 10)
Complete and prolonged relaxation of all visceral smooth muscle.	Smooth Muscle	Directly depresses smooth muscle
Dilation of the bronchi; increase in respiratory rate, deeper breathing.	Respiratory Passages	Dilation of the bronchi; stimulation of the respiratory center, deeper breathing.
Acts directly upon heart muscle	Heart Muscle	Depresses vagus nerve, thus affords some stimulation of cardiac muscle
No increase in blood pressure; no appreciable change in heart rate.	Blood Pressure	Increases the blood pressure; 1 mg hypodermically will double pulse rate in 20 minutes
Feeling of warmth, nausea, vertigo, all disappear in an hour	Toxicity	Dilation of cutaneous vessels, flushing of 'blushing area'; increased blood pressure; increased pulse, etc.

# THE PHARMACY CURRICULUM

COMMENTS ON THE PROBLEMS AND CONSIDERATIONS INVOLVED IN REVISING THE PHARMACY CURRICULUM

BY E. L. CATALINE AND LEE WORRELL\*

Progress in pharmacy is fundamentally based upon the training of the pharmacist through the agency of adequately prepared and capable teachers in properly equipped class rooms and laboratories and guided by a basically sound curriculum. Much thought, time and energy have been given to the improvement of this training. Much more must be contributed if pharmacy is to continue to progress. Furthermore, the experienced opinion of all members of the profession of pharmacy must be consulted by those who are immediately responsible for the actual construction and improvement of the pharmacy curriculum if an effective job of training is to be accomplished. Thus, it is encouraging to note the interest evidenced by the hospital pharmacists through the publication of a suggested curriculum and other suggestions by Mr. Leo F. Godley in the July-August, 1947, number of THE BULLETIN. Thinking educators everywhere will welcome such suggestions and will seriously consider them.

In his article, Mr. Godley urges study and solicits discussion of his suggestions. It is in this spirit that the following comments, based upon considerable experience in the building, revising and operation of the pharmacy curriculum, are offered.

Since colleges of pharmacy generally admit students directly from high school, it is important that the high school curriculum should be such that the best possible preparation should be obtained by the student who intends to enter a college of pharmacy. The first of Mr. Godley's suggestions concerns this vital subject. He lists, as the proper requirements for entrance to a college of pharmacy, four years of mathematics, two years of language, and history, economics, English and science "in standard amounts". In addition, he believes that courses in bookkeeping, typewriting, shorthand and business English

"would appear indispensable". There is little doubt that the program outlined would, in one way, approach the ideal. However, experience indicates that in practice it would be an unapproachable ideal since in very few high schools (usually only those in large cities) are all of these courses available. For instance, only exceptionally can three and one-half years of mathematics be obtained and very often, in the smaller, rural high schools, only two years of mathematics are offered. Similar difficulties are found with several of the other courses mentioned. To establish such requirements for admission would, indeed, constitute denial of admission to many worthwhile and capable individuals or would penalize them by making it necessary for them to make up deficiencies by enrolling in post-graduate or extension courses. The foreign language requirement was recently considered by the Faculty of the University of Michigan College of Pharmacy. Thorough investigation and discussion led to the conclusion that, while high school language might in some ways be desirable, it appeared not to be an absolute necessity. Incidentally, the same conclusion has been reached by many undergraduate colleges and departments. Another point to be noted is that a curriculum made up of the "indispensables" mentioned above would be so nearly completely filled that the student would have virtually no time for other worthwhile courses or activities such as sports, music, publications, dramatics and so on.

In general, the variance of high school curricula makes it virtually impossible to set up extremely rigid requirements for admission. Furthermore, there is some reason to doubt that, even if it were possible, such a course would be desirable. Most persons do not definitely decide upon a career until they are well into, or have even completed their high school studies. It would seem, therefore, that one of the vital functions of the high school should be to offer to the student an opportunity to gain information

\*From the University of Michigan College of Pharmacy

relative to as many of the professions as possible and thus enable him to choose more wisely.

The pharmacy curriculum suggested by Mr. Godley merits serious consideration. Certainly, completion of the courses mentioned would furnish a fine background for the practice of pharmacy and especially for graduate work in pharmacy, chemistry or pharmacology. However, when the curriculum is analyzed objectively, a number of points of difficulty are seen.

First, the suggested curriculum covers a period of five years. Before the five-year curriculum is adopted the questions of whether or not a five-year program is necessary to accomplish the objectives of pharmaceutical training, whether the program is economically justified, and the effect upon staff, facilities and finances must be carefully considered and answered. The present authors believe that experimentation with non-obligatory five-year curricula is necessary to provide data upon which to base the answers to these questions and many others. For this reason the authors are not disposed to consider the problem in this discussion.

A second problem would immediately appear if one were to attempt to put the suggested curriculum into operation generally. This is that the credit hour values assigned to comparable courses in different institutions vary to a considerable degree. For instance, the credit hour values of beginning courses in foreign languages vary from three to five. In some instances Mr. Godley has assigned the lower values to the courses listed. When a number of these occur in the same semester, the student's load becomes extremely heavy. Basing the credit hour values on the courses offered at the University of Michigan, the credit hour loads for the first four semesters of the suggested curriculum are 19, 17, 20 and 20, respectively. It can be seen that in three of these four semesters the student's load would be entirely too great. In other instances, Mr. Godley has assigned credit hour values which are in excess of those usually given in collegiate institutions. For instance, it is probably impossible, at most institutions, to obtain ten hours of physiology or twelve hours of pharmacology in the course of one year. Other examples might be mentioned if space were available.

The apparently obvious solution to such problems as those just mentioned is the establishment of special courses for pharmacy students. While such a procedure is, no doubt, theoretically advantageous, particularly since it would be supposed that such special courses would be tinged with the pharmaceutical attitude, it is, unfortunately, beset with the difficulties of financing, acquisition of extra staff members, and,

many times, considerable duplication of effort, as well as others. The college which is connected with a university must, of necessity, utilize existing courses. This situation is admittedly restrictive and would seem at first to be unfortunate. However, the advantages of university-type association are many and obvious.

Another point which should be considered is the lack of flexibility of the proposed curriculum. First, there is virtually no opportunity for the student to elect additional courses which would round out his professional training. Of course, it is realized that the possibility of this type of flexibility will be limited in any four (or even five) year curriculum in pharmacy since the amount of necessarily required work is large. Still, some institutions have made it possible for the student to elect advanced or special courses in chemistry, biology, public health, pharmacy and so on, which will enable him to prepare himself better for the particular field of his choice. Secondly, although two years of English and foreign language, and courses in history, economics and psychology are listed in the suggested curriculum, there is no opportunity for the election of such courses as sociology, political science, journalism, geography, geology, and many others of the so-called "cultural" group which are not only desirable but invaluable in complementing the professional training of the student. Some people are of the opinion that "cultural" courses have no place in a professional curriculum. However, when it is considered that the professional individual must live with people, and be a part of his community, such a position is seen to be untenable. The objective of collegiate training in pharmacy is not to produce pharmaceutical machines but to provide prospective pharmacists with as good a background as possible for life in a complex and ever-changing world.

An excellent feature of the suggested curriculum is the postponing of the courses in pharmacy until many of the basic courses in chemistry and other sciences have been completed. Another is the integration of such things as arithmetic and Latin into the courses in pharmacy. Furthermore, the authors are in general agreement with the plan of arranging the pharmacy of the curriculum into three general parts. It should be pointed out, however, that this arrangement would result in certain difficulties. Practically, the arrangement allows little latitude for the development of specialties by members of the staff who may, by training, be particularly able to enrich the training of the student. Further, there is little of the flexibility previously mentioned. All students are molded to the same pattern despite their special desires and capabilities, and the demands of the various phases of



the profession of pharmacy.

In a few instances the arrangement of courses in the suggested curriculum is unsatisfactory. Assuming that differential and integral calculus were to be required (and there is considerable question whether they should be required for all pharmacy students), it would be necessary to require analytical geometry which does not appear in the suggested curriculum but is a universal prerequisite for the calculus. Also, in the third year, physical chemistry and physics are listed as being taken simultaneously, although physics is invariably a prerequisite for physical chemistry. Further, simultaneous enrollment in qualitative analysis and organic chemistry (second year) would be impossible wherever the former is considered to be prerequisite to the latter. This combination, and that of quantitative analysis and organic chemistry would, in many instances, be difficult because of the amount of time required for the laboratory work of each course. In addition, the placing of pharmacognosy in the last year (as a part of the course labelled "Pharmacology") is open to question.

Among other questions which occur to one as he peruses the suggested curriculum is the following: Is it necessary to require all students to take two years of foreign language, mathematics through calculus, and such extensive courses in physiology and pharmacology? More generally there is the question of whether or not all students should be restricted to the same program. Mr. Godley apparently believes that they should. The present authors believe that the curriculum should be so built that there will be (1) a core of fundamental courses, required of all students,

(2) optional groups of courses which would allow the student to prepare himself for some specific type of pharmaceutical endeavor (pharmacy-journalism combination, for instance) and (3) some opportunity for the election of the so-called "cultural" courses, the choice to be that of the student himself, based upon his own interest. Such a curriculum would, probably, be of such a nature that it could be completed in four years. If, upon graduation, the student should find more training necessary, he could pursue graduate work toward higher degrees. Incidentally, the fact that the student might not be adequately prepared to pursue graduate work in even relatively closely allied fields is not just cause for criticism of the program for it is no more possible for colleges of pharmacy to prepare students for graduate work in biology, chemistry, physics, physiology, and so on, than it is for other undergraduate colleges and departments to train all their students so that they will be prepared to do graduate work in pharmacy.

No specific curriculum is suggested here for it is believed that each college of pharmacy must develop its own, making use of the facilities at its disposal. Certainly, any curriculum must maintain a balance between the basic sciences, both biological and physical, and pharmacy, and should exhibit some flexibility. Above all, no curriculum should ever be allowed to crystallize immutably. If such is ever the case, then will progress have ceased and those to whom has been entrusted the stewardship of pharmaceutical training had better "fold their tents like the Arabs and as silently steal away".

## the suggested pharmacy curriculum

BY HENRY J. GOECKEL, PHM. D.  
CRANFORD, NEW JERSEY

I read with interest Leo F. Godley's outline for a "Suggested Pharmacy Curriculum" to qualify pharmacists to make the contributions to society which pharmacy is capable of making<sup>1</sup>.

There are a few things in the outline which if wrongly interpreted may lead to retrogression rather than to progress. One of these is the lack of emphasis upon the kind and extent of the fundamental education. As an illustration, I con-

sider any basic chemistry education below the minimum standards set by the American Chemical Society as intolerable and a breach of faith with those who may in the future choose pharmacy as a vocation.

As pharmacy is in reality an extended and highly specialized chemical vocation, a graduate in pharmacy should be qualified for membership in the American Chemical Society as well as in

the American Pharmaceutical Association.

It is hoped that the American Pharmaceutical Association will some day follow the lead of the sister professions and set definite standards for membership. Standards which have the degree of flexibility of those of the American Chemical Society and not the rigid short-sighted type of the American Medical Association.

In 1927 the writer prepared a comparative survey of the organization and activities of the National Associations for medicine, dentistry, nursing, chemistry and pharmacy in which organized professional pharmacy was a sorry "also ran" to such an extent that the Association officers attempted to suppress the paper. It was, however published as a feature article by the *Druggist Circular*<sup>2</sup>.

Fortunately in such a survey today, pharmacy will rate far more creditably. The future is bright. With the American Society of Hospital Pharmacists members alive to their opportunities; with the frank stock-taking by the Elliott survey and the apparent determination of the energetic present secretary of the A.Ph.A., the Association membership and activities are advancing creditably. Bob Fischelis has been a member of the American Chemical Society for many years and an active observer of the other professional groups. He will no doubt do all in his power to guide and keep pharmacy on a par with the others.

Another debatable point is placing pharmaceutical chemistry as a subsidiary part of pharmacy. The chemical advancement of pharmacy is of such importance as to warrant a distinct department for pharmaceutical chemistry, possibly with divisions for inorganic, organic, and for physical chemistry.

We hear much about the uselessness of pharmacognosy and the study of plant histology. The majority do not realize that this seemingly useless branch of pharmacy education has been extremely important for those who have branched out beyond the confines to which most retail pharmacists have limited themselves. These branches of pharmaceutical education have not only aided in training such men in the methods and the extent of the microscope's value—they have actually proven a very important part of the pharmaceutical analyst's and pharmaceutical chemist's equipment.

The writer has followed with interested amusement the enthusiasm in the past twenty years of the members of other branches of chemical endeavor in their discovery of the value of microchemistry. Even back in the closing years of the last century while other chemists were using lower powered microscopes to get acquainted with crystallography, the pharmaceutically trained analyst utilized his knowledge of microscopy to shape the course of his chemical activities.

The writer was very much puzzled in his earlier days as an analyst in finding his services as a private analyst used by one of the larger producers of pharmaceutical and heavy chemicals with forty or more chemists and chemical technicians in their plants. He saw the light when in answer to a direct enquiry as to why such work was passed out, the management stated it was because it paid to do so. If they took one of their chemists off of his assigned work he would probably take a week or more to do library research and to map out a scheme of analysis and maybe another series of weeks to complete the work. The final results would cost hundreds of dollars and would be reported in unworkable form, whereas for \$25 or \$50 they got their results within a week or so from me with a report in such form as to be understandable and utilizable.

The difference, I then realized, was due to the fact that a pharmaceutical educated chemist used chemistry only as a secondary means for verification and quantitative determinations after a thorough microscopical examination for crystals, fibres, gums, resins, etc., and trial low-power observations for solubilities etc.

In planning a revised pharmacy curriculum the truly pharmaceutical parts have social as well as utilitarian values which must be conserved and if possible improved.

The true pharmacy parts must be kept within a "Pharmacy Faculty" and not farmed out to the chemistry, biology or medical department of the university.

(1) Godley, Leo F. - *The Bull. Amer. Soc. Hosp. Pharmacists*, Vol. 4, 1947, p. 147.

(2) Goeckel, H. J. *Druggist Circular*, Vol. 72, 1928, p. 7.





## BOOK REVIEWS

Edited by **SISTER MARY ETHELDREDA**  
CHIEF PHARMACIST, SAINT MARY'S  
HOSPITAL, BROOKLYN

**FORMULARY OF THE UNIVERSITY HOSPITAL**, Ann Arbor, Michigan. Don E. Francke, editor 420 pages, 7 7/8" x 7 1/4", 1947, Second Edition. University Lithoprinters, Inc., Ypsilanti, Mich. Price \$3.75

The author in the preface to the second edition states: "If a hospital formulary is to be of value it must be kept constantly abreast of the recent developments in new medicinal agents. In an attempt to accomplish this several of the newer, accepted therapeutic agents have been included in this revision and many sections of the book have been rewritten."

The text follows a therapeutic or physiological classification. Official English titles appear in bold print. Synonyms and common names are also given. A unique feature of this type of book is the inclusion of graphic formulae for chemical drugs; a compact description of each item with precautions and helpful dispensing and prescribing information and a brief pharmacological review. Dosage is recommended and available preparations are listed.

Some of the newer products included in the second revision are: amino acids, methionine, protein hydrolysates, methadon, dihydroergotamine, metopon, pyribenzamine, propylthiouracil, meralluride, nitrofurazone, urea peroxide, mesantoin, and urethane for leukemia.

Although the text is intended for the University of Michigan Hospital, it may be a handbook of useful information for any hospital pharmacist. Physicians find it helpful in their office practice. Interns appreciate the information so readily adaptable to clinical cases on the hospital units.

**PHARMACEUTICAL ARITHMETIC**. By Ignatius J. Bellafigiore, 396 pages, 8" x 10 1/2", 1947, Second Edition. C. V. Mosby Co., St. Louis, Mo.

This workbook is primarily prepared for Pharmacy students. However, it may be a valuable aid to the young graduate or hospital pharmacy intern who is frequently perplexed by the prob-

lems of bulk manufacturing.

Some of the typical exercises included cover: computing of costs of bulk formulae; dispensing aids for minute doses by the use of stock solutions and triturations; preparations of convenient concentrated stock solutions for preparing more dilute solutions on the hospital nursing units; explanation of units and the term microgram in terms of vitamins and antibiotics.

The prescriptions for exercise purposes are of current practice and include newer therapeutic agents. A fine chapter on the preparation of isotonic solutions with an excellent explanation of the fundamentals as abstracted from recent literature adds to the usefulness of the text.

**PHARMACOLOGY, THERAPEUTICS AND PRESCRIPTION WRITING**. By Walter Arthur Bastedo, Ph.G., Ph.M. (Hon), M.D., Sc. D. (Hon.), F.A.C.P. 840 pages, 6" x 9 1/2", 1947, Fifth Edition, Published by W. B. Saunders Co., Philadelphia, Pa. Price \$8.50

Because of the recent rapid advances in the use of therapeutic agents the Fifth Edition of the text has been completely rewritten. The book is intended for the practitioner and for the student but should find great use by the hospital pharmacist who is frequently expected to give detailed, specific and authoritative information on the action and use of drugs.

Part One - consists of 43 pages giving much general fundamental and preliminary information on plant principles, official texts, dosage, administration and the mode of action of drugs. Part Two - devotes 733 pages to individual remedies following a therapeutic classification. Among the newer agents included are: amino acids, blood fractions, coagulants and anti-coagulants, antihistamines, anti-convulsants, folic acid, rutin, sulfonamides, antibiotics, demerol, metopon, cardiac glucosides, antimalarials, and mercury diuretics.

The book is probably the best up to date advanced text on Pharmacology. It is highly recommended for the hospital pharmacist's library.

# Luther Hospital

## MEDICAL STAFF BULLETIN

EAU CLAIRE, WISCONSIN

No. 48

DEPARTMENT OF PHARMACY

May 15, 1947

### PROTEIN DERIVATIVES

Many Amino Acid and Protein products have appeared on the market in recent weeks. Although it is difficult to compare them, certain generalizations can be made.

There are two distinct types of preparations: the products which are Proteins and the products which are hydrolyzed to Amino Acids. All but one of the products studied are derivatives of casein and lactalbumin obtained from milk. 100 grams of pure casein hydrolysate would equal about 400 grams of dried skim milk. However, since they are only 80% hydrolyzed, 100 grams of a commercial product would equal about 320 grams dried skim milk.

It cannot be emphasized too strongly that palatability, while important, should be the last consideration of the physician in the choice of a protein source. Up to this time it has not been found possible to remove the characteristic taste of a protein hydrolysate. Palatability in protein preparations has been achieved only by the use of native (not predigested) protein or by the substitution of carbohydrate for a considerable portion of the protein in the preparation.

The table below lists the composition of several of the products now available and their approximate costs.

	Product	Amino Acids	Protein	Source	Carbo-Hydrate	Calories (Per 100 Gm.)	Vitamins	Price (Per#)
A M I N O  A C I D S	Aminoids (Arlington)	45%		Milk Beet Wheat Yeast	40%	330	No	\$3.75
	Essanamine (Stearns)	80%		Lactalbumin (Milk)	None	400	No	\$6.25
	Protolysate (Mead-Johnson)	77%		Casein (Milk)	None	375	No	\$3.75
	Provisate (Wyeth)	50%		Lactalbumin (Milk)	37%	360	Yes	\$3.50
	Casein Hydrolysate (Squibb)	85%		Casein (Milk)	None	380	No	\$4.90
P R O T E  M I L K	Delcos (Sharp & Dohme)		50%	Lactalbumin Casein (Milk)	30%	320	No	\$3.50
	Ledinae (Lederle)		54%	Liver Digest	38.5		Yes	\$6.00
	Dried Skim Milk		26.7%	Milk	38%	478	No	\$0.13

### SUMMARY

#### AMINO ACIDS

1. Derived from casein.
2. Unpalatable.
3. Cost from 3.75 to 6.25 per pound.

#### PROTEINS

1. Generally derived from casein.
2. Palatable.
3. Cost from 3.50 to 6.00 per pound.
4. Contain 35% to 40% Carbohydrate.

#### DRIED SKIM MILK

1. Derived from milk.
2. Palatable.
3. Costs about 13¢ per pound.

# **THE *development*** **OF A MEDICAL STAFF BULLETIN**

BY PAUL G. BJERKE, CHIEF PHARMACIST  
 LUTHERN HOSPITAL  
 EAU CLAIRE, WISCONSIN

Much has been written on inter-professional relations and how this relationship may be improved. With this in mind, the development of a Medical Staff Bulletin at our hospital is presented.

Luther Hospital is a two-hundred bed general hospital in Eau Claire, Wisconsin. A school of nursing is operated in connection with the hospital. The Attending Staff numbers forty-five physicians and fifteen physicians make up the Associate Staff. The writer became the first full-time pharmacist of the hospital in March, 1943.

The objective in issuing a Pharmacy Bulletin was to present to the entire Medical Staff information concerning new drugs. Before issuing the bulletin, certain basic ideas on its presentation were discussed. We decided that the bulletins would be informative but brief. They would, for the most part deal with one particular problem or one or two new products. The physician would then be able to tell at a glance if he were interested and would spend very little time in reading the bulletin. If it were a problem with which he was especially concerned and the release did not give him sufficient information, he would naturally come to the Pharmacy for more detailed information. With this inducement in mind, we encouraged the return of the physician by never being too busy to investigate any problem, no matter how much time it consumed. The bulletins would not be issued at any particular time but only when there was something of particular interest. Our objective was to make each bulletin valuable to the physician instead of flooding him with inconsequential releases.

Our first Pharmacy Bulletin was issued in the form of a letter on May 27, 1942. It informed the doctor of a Vitamin B Complex Elixir that we were manufacturing. The reception of this product was very encouraging and it is interesting to note that today we use very little, if any, other Vitamin B Complex Elixir.

The encouragement received on the first release, however, was short lived. Our next release concerned the intravenous use of Amino Acids, and much to our surprise proved to be

a failure. In analysing the situation we quickly learned that we could not interest the entire staff in any certain phase of therapy and that most physicians would prescribe a Vitamin B Complex Elixir, whereas even today very few of our staff members are enthused over the use of amino acids intravenously. We then made it a policy to publish bulletins on subjects which would be of interest to the majority of the staff.

The Management approved of the Medical Staff Bulletins and the October 4, 1943 issue was distributed on hospital stationery. Penicillin was then being controlled by the National Research Council and the subject of this bulletin was the procedure for obtaining it. This proved to be of great interest to the Medical Staff and in a short time we were making requests for the drug. This, perhaps was one of our most successful bulletins.

The type of bulletin was changed on November 11, 1943, with a printed letter head; LUTHER HOSPITAL MEDICAL STAFF BULLETIN, EAU CLAIRE, WISCONSIN. The introduction of this type of bulletin by the Management was a step to enlarge the scope of the bulletin to include other departments besides the Pharmacy. The bulletin has been used by the Manager as well as the X-Ray, Laboratory and Dietetics Departments. With the addition of a new Physiotherapist, that department has been given added emphasis through the use of the Medical Staff Bulletin. When the bulletin is issued by the Pharmacy, "Department of Pharmacy" is printed below the general heading.

In February, 1945, the Department informed the Medical Staff of the manufacture of penicillin Lozenges. These were made from unflavored gelatin to which a preservative had been added. Efforts to purchase a mold were unsuccessful, but an aluminum cake pan which had squares etched on the bottom was used as a mold. After the mixture had been chilled in this mold for a few minutes, a knife was used to divide the product into squares. Since penicillin lozenges were not commercially available and there were many indications for their use, the demand for them was immediate. They were manufactured



in the Pharmacy until commercially available.

One of our most recent bulletins has been a short review of oral Protein Derivatives. In it we have discussed the various commercial products available and classified them as Proteins or Protein Hydrolysates. They have been compared as to their amino acid or protein content, the source, calories, price and as to the addition of vitamins. They in turn have been compared to dried skim milk. This comparison has brought out the fact that if protein is indicated, dried skim milk is a good source, palatable, and an inexpensive form.

Our latest bulletin informs the physician of the availability of Coccidioidin Diagnostic Test. With this test the physician is able to tell if the patient has been exposed to this fungus of the San Joaquin Valley, California. Since X-Ray findings of this fungus are similar to pulmonary tuberculosis and virus pneumonia, the test can be of great value. The bulletin also lists several new

products now available in the Pharmacy.

Subjects of some of the other bulletins distributed have been: Blood Fractionation Products, including a brief summary of Fibrin Foam, Thrombin Topical, Dried Human Blood Cells, and Immune Globulin; Streptomycin; Amino Acids; Aralen; Dihydroergotamine; and Drug Costs.

We have felt that the use of a Medical Staff Bulletin in our hospital has been very successful. It has been an aid to the Pharmacy in enjoying greater prestige in the hospital. Through it we have come closer to the Medical Staff. The pharmacist attends and participates in monthly staff meetings and weekly clinic-pathological conferences. It has been for us an incentive to build and maintain an adequate library—a reference file of commercial literature—to help the physician do his reading and make the Department of Pharmacy more valuable to the physician, his patient and the hospital.

## NOTES AND SUGGESTIONS

EDITED BY

GEORGE L. PHILLIPS

ASSISTANT CHIEF PHARMACIST  
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### COLOSTOMY AND ILEOSTOMY PROTECTANTS

Irritation to skin surrounding colostomy and ileostomy openings may be alleviated by protective coatings formed by non-soluble liquid ointments or by coatings formed from organic solutions of the polyvinyl type resins.

#### ALUMINUM PASTE 25%

Aluminum Powder	25.0 Gms.
Petrolatum, to make	100.0 Gms.

Mix thoroughly, "wetting" the aluminum powder with a small portion of liquid petrolatum to reduce flying dust.

Aluminum powder is available from: General Chemical Company, New York City. Merck and Company, Incorporated, Rahway, New Jersey. Mallinckrodt Chemical Works, St. Louis, Missouri.

### CUP GREASE

Oddly enough this car transmission type lubricant works quite efficiently as a protectant on human skin also. Probably most brands would work equally well. The particular one we used was Superla Grease #57 produced by Standard Oil of Indiana. Trail batches could be secured from your local oil dealer.

### POLYVINYL RESIN SOLUTIONS

Polyvinyl Acetate (Vinylite AYAF)	25.0 Gms.
Acetone	100.0 cc.
Nitrocellulose	1.3 Gms.
Phenol	0.8 Gms.

Make solution by agitating in a stoppered bottle. A solution of this type is painted on the skin surrounding the colostomy opening and dries to form a protective coating of solid vinylite

resin. This formula was developed several years ago by De Bolsoy and Giles to be applied to the skin of the area involved before surgery.

Another formula of this same general type is as follows:

Polyvinyl Butyrol Resin	20.0 Gms.
Alcohol 95%	120.0 cc.
Ether	20.0 cc.
Castor Oil	10.0 cc.

Also prepared by agitation in a closed container.

Vinylite resins are available from: Carbide and Carbon Chemicals Corporation, 30 East 42nd Street, New York City. References for resin solutions: De Bolsoy and Giles, Science News Letter, 40:311, (1941); Bakelite Review, April (1942) p. 7. Archives of Surgery, 47:583, December (1943).

#### SYRUP OF ASPIRIN

Aspirin in liquid form serves as a convenient means of administering same to children. The formula given below was taken from The Pharmaceutical Recipe Book III, p. 237.

Aspirin	30.0 Gms.
Potassium Citrate	90.0 Gms.
Sucrose	246.0 Gms.
Tincture of Lemon	10.0 cc.
Distilled Water	225.0 cc.
Glycerin, to make	1000.0 cc.

Dissolve the aspirin and potassium citrate in the distilled water. Percolate the sucrose with the solution and return it, if necessary, until the sucrose has been dissolved. Add the tincture of lemon and sufficient glycerin to make the product measure 1000 cc.

Note: This syrup should be freshly prepared.

#### INTRAVENOUS PROCAINE HYDROCHLORIDE

Recently some requests have been received for procaine hydrochloride for intravenous drip administration for the relief of severe pain such as that associated with arthritis. This was prepared as follows:

Procaine Hydrochloride	1.0 Gm.
Injection Sodium Chloride 0.9%	1000.0 cc.

Use ampules of procaine hydrochloride crystals and transfer aseptically to the liter administration flask for extemporaneous use. May also be made up and sterilized by autoclaving at 121° C. for 20 minutes when desired as a stock preparation. If latter technique is followed, unsterile procaine hydrochloride crystals may be used.

Caution: Test for sensitivity with wheal test before administering. Rate should be 100 or 200 drops per minute for 30 to 90 minutes.

Antidotes: Convulsive type reaction - give sodium pentothol intravenously. Respiratory asthmatic type - give two to four minims of epinephrine hydrochloride injection 1-1000 subcutaneously.

Reference: Current Research in Anesthesia and Analgesia, March-April (1947) p. 56.

#### SEASICKNESS CAPSULES

The formula given below has been recommended for seasickness and undoubtedly would be well suited to any motion sickness such as car, train and air. The formula per capsule is as follows:

Sodium Amytal*	60.0 mg.
Scopolamine Hydrobromide	0.2 mg.
Atropine Sulfate	0.15 mg.

\*Sodium Pentobarbital could be used here.

Reference: J.A.M.A., 131:971, July 20 (1946).

#### ANESTHETIC LUBRICANT

Urologist frequently requests a local anesthetic for alleviating the pain associated with insertion of instruments into the urethra. Two rapid acting local anesthetics each suited for this purpose are nupercaine hydrochloride and pontocaine hydrochloride.

Nupercaine Hydrochloride	0.5%
Surgical Lubricant, to make	100.0%

Pontocaine Hydrochloride	0.75%
Surgical Lubricant, to make	100.0%

Dissolve the salt in minimum quantity of water and mix thoroughly with the lubricant. Pack in applicator tubes for convenient insertion.



# Therapeutic Trends

New Trends in Medicine and Pharmacy Include  
 NITROGEN MUSTARD TO TREAT MYCOSIS  
 FUNGOIDES - INHALATION OF PENICILLIN  
 DUST - NEW SYNTHETIC ANALGESIC -  
 PODOPHYLLIN IN CANCER - NEW ANTIBI-  
 OTIC - THEPHORIN

## PODOPHYLLIN IN CANCER

Laboratory experiments using podophyllin to treat cancer of mice may lead to a new use of this drug for its anti-cancer action. According to *Science* (April 25, 1947), cytological effects of podophyllin were first noted when cancer cells were dying before normal cells in a test tube containing only the nourishing materials for cell growth. On investigation the research workers found that the serum in the tubes had been obtained from placental blood from a woman who had been given podophyllin in the treatment of venereal warts. This led to investigations to determine the effects of podophyllin on cancerous tissue.

Previously, other research workers had also noted cellular effects of podophyllin strikingly similar to those produced by colchicine which arrests tumor cell division in metaphase. By using saturated aqueous solutions of podophyllin it was found that the cytological effects are due to a substance in solution. Further experiments are being carried out to determine which of the constituents of podophyllin produces the cytological changes in cancerous tissue.

Toxicity to the cell is negligible except in prolonged treatments involving agitated suspensions. Further studies will be carried out to determine



the use of podophyllin in cytologic research.

## INHALATION OF PENICILLIN DUST

Inhalation of penicillin dust has been found to be more effective than inhalation of the vapor according to a report in *Science* (September 12, 1947). In addition to the greater effectiveness of this method of aerosol technic, it also presents the advantage to the patient of not having to use the cumbersome equipment necessary for administration of aerosol vapors.

Sixty-eight patients with respiratory tract infections were treated by a group of physicians working at Wesley Memorial Hospital in Chicago. Fifty-five patients had upper respiratory infections and nine had lower respiratory tract infections. The crystalline sodium penicillin was processed to particles of 50-100 mesh, and dust containing 100,000 units of penicillin was inhaled for twenty minutes three times a day. Symptoms of over 70 per cent of those patients with acute conditions of the upper respiratory tract cleared up markedly, in many instances after only one or two treatments. Seventy-five per cent of the patients with upper respiratory tract infections had only one treatment.

Since penicillin is effectively absorbed by this method of treatment, it is possible that inhalation treatment might be used for systemic conditions other than those of the respiratory tract.

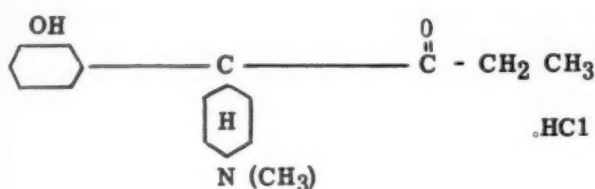
To date no sensitivity reactions to penicillin therapy by this method has been noted.

## NEW SYNTHETIC ANALGESIC

A new synthetic analgesic drug designated as K 4710 has been investigated clinically in sixteen obstetric cases and reported in *Anesthesia and Analgesia* (December 1947). In this preliminary study using K 4710, 37.5 per cent of the patients experienced complete relief from pain, 25 per cent experienced partial relief, while

37.5 per cent observed no relief. The drug was given in doses of 10 mg., and repeated in four hours if necessary. It was also administered in doses of 5 mg. in combination with scopolamine which appeared to be no more effective than K 4710 when given alone. Further studies will be carried out to determine the value of K 4710 for pain from various causes, particularly intractable pain in malignancy, renal colic and fractures.

K 4710 is a substituted phenylpiperidine derivative similar to demerol, and is one of the new analgesic agents prepared by German chemists.



In earlier studies (*Science*, December, 1946), K 4710 which is also known as 10720, was among a group of six compounds which were compared with demerol and 10820 (methadon). Experiments on animals indicates that K 4710 has an analgesic activity about ten times that of demerol and approximately equal to that of methadon.

Injections were made intravenously and the effects on circulation, respiration, and salivary (submaxillary) flow were measured with standard procedures in dogs under barbiturate anesthesia. The median lethal dose in mice by intravenous injection was ascertained for each compound.

K 4710 was found to be less toxic to mice than methadon by the intravenous route. Orally it is approximately 50 per cent as toxic as methadon. It is mildly irritating at concentrations up to 2 per cent as observed in rabbit eye irritation tests. Peculiar ocular effects were observed in mice after the oral or intravenous administration of K 4710. This peculiar opacification of the eye did not occur in rabbits.

Both K 4710 and methadon cause a depression of respiration, and a decrease in blood pressure and heart rate. K 4710 produces a slight initial depression of the central nervous system which is followed by a slight stimulation about three hours after administration. There is a definite antagonism to the C.N.S. stimulation due to administration of d-desoxyephedrine. It has a moderate spasmolytic action against barium chloride induced spasms of the isolated rabbit ileum, but only slight action against acetylcholine or histamine induced spasms.

K 4710 is available from the Winthrop Chemical Co., Inc. for experimental use only in 10

cc. multiple dose vials, each cc. containing 5 mg. of the drug.

#### NITROGEN MUSTARD TO TREAT MYCOSIS FUNGOIDES

Methyl-bis (beta-chloroethyl) amine hydrochloride (nitrogen mustard) has proved effective in the treatment of a usually fatal skin disease known as mycosis fungoides. Earlier reports showed that mustard gas is effective in treating certain blood dyscrasias as Hodgkin's disease, lymphosarcoma and leukemia. To this group of diseases which have a common generic term of "lymphoblastoma" belongs this condition known as mycosis fungoides. The marked effects of beta-chloroethyl amines on lymphoid tissue and the observation that hyperplastic tissues are susceptible to the cytotoxic action of these compounds suggested their therapeutic use. Characteristic symptoms of mycosis fungoides include hard reddish tumors of the skin which tend to spread and ulcerate.

In a clinical study reported in *The Journal of Investigative Dermatology* (October, 1947), six patients who had mycosis fungoides were treated with nitrogen mustard, four cases of which had become resistant to roentgen therapy. Nitrogen mustard appears to produce the same effect and to bring about the same clinical results as does roentgen therapy. It has been suggested that responsiveness to therapy radiation occasionally may be restored after a course of treatment with this drug. This was not demonstrated in the study but it is apparent that nitrogen mustard in the treatment of mycosis fungoides is an adjunct to previously recognized therapeutic measures and is of particular value when roentgen therapy is no longer of benefit.

The drug was administered intravenously in a dosage of 0.1 mg. per kg. of body weight. A course of treatment consisted of four such doses given on successive days. The decision to employ subsequent courses depended on the clinical response, the condition of the patient and the status of the hematopoietic system. Additional courses were not given sooner than six weeks after the preceding course. Reactions to the drug are frequent, acute, and occasionally severe; but in all cases it was possible to complete a course of therapy without serious ill-effects.

# Timely Drugs

ETAMON CHLORIDE - CARONAMIDE -  
BENADRYL INJECTION - PYRIBENZAMINE  
OINTMENT AND CREAM - ARE DRUGS OF  
TIMELY INTEREST TO THE HOSPITAL  
PHARMACIST

ETAMON CHLORIDE . . . is the trade name of Parke, Davis and Company for the quaternary ammonium compound tetraethyl ammonium chloride. It is a new autonomic blocking agent employed diagnostically or therapeutically in the treatment of patients suffering from hypertension, thromboangiitis obliterans (Buerger's disease), peripheral arteriosclerosis, causalgia, trenchfoot, immersion foot, and other diseases in which the peripheral circulation is disturbed. It is used to relieve the pain of peptic ulcer, and the pain and diarrhea of ulcerative colitis.

Etamon chloride acts by blocking the transmission of sympathetic and parasympathetic nerve impulses at autonomic ganglia. This blockade results in vasodilation producing an increase in skin temperature of the extremities. There is also an increase in pulse rate, a fall in arterial blood pressure and a pronounced decrease of gastro-intestinal motility, including a decrease in the volume and activity of gastric secretion.

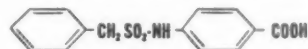
Side effects which may follow the injection of the drug include the following; however, no major toxic effects have occurred when administered in the recommended dose range: a metallic taste is produced, followed rapidly by a cold feeling and a tingling sensation in the extremities, a loss of ocular accommodation, incomplete dilation of the pupils, decreased sweating, and dry mouth. Sensation of weakness, fatigue, lightheadedness, nausea and loss of appetite may be experienced by some patients. Postural hypotension may develop immediately after administration and may persist for as long as 60 minutes. It is therefore, important that the patient be kept in a recumbent position for one hour following administration of the drug.

When administered intravenously a dose of 0.2 to 0.5 gm. (2 to 5 cc.) of Etamon Chloride is generally employed. It should not exceed 7 mg. per kg. of body weight. Effects from intravenous administration of the drug usually appear immediately. Frequency of injection depends upon duration of relief from symptoms. The drug may also be administered intramuscularly and the dose is 1 to 1.2 gms. (10 to 12 cc.), giving 5 to 6 cc. in each buttock - the dose should not exceed 20 mg. per kg. of body weight. The dur-

ation of action after intramuscular injection is from 6 to 8 hours. Local tenderness and a mild burning sensation may result from intramuscular injection of the drug. Etamon is poorly absorbed orally.

Etamon chloride is available in 20 cc. rubber diaphragm-capped vials containing 0.1 gm. of tetraethyl ammonium chloride per cc.

CARONAMIDE . . . is soon to be released by Sharp and Dohme as tablets containing 0.5 gram under the name of STATICIN. Chemically, caronamide is 4' carboxyphenylmethanesulfonanilide. It is a free acid, relatively insoluble, tasteless and colorless. It forms a monosodium salt which is readily soluble in water. Both the acid and the sodium salt are therapeutically effective.



This new chemical increases and greatly prolongs penicillin blood levels by inhibiting its excretion through the kidney tubules. Since the kidney tubules are responsible for the excretion of 80 per cent of the penicillin administered, it may be readily seen that if this process can be retarded more penicillin will remain in the blood for a longer period of time.

Caronamide does this by blocking the enzyme which is responsible for the transportation of penicillin from the proximal tubules to the lumen of the tubules and thence to the bladder. As a result, tubular excretion of penicillin is suppressed and high blood levels of penicillin are maintained for a prolonged period of time. Caronamide, itself, is, in time, excreted by the glomerulus, and the kidney tubules regain their normal power to excrete penicillin. Caronamide is nontoxic to children as well as adults even when administered in relatively large doses over a long period of time.

The optimal dosage of caronamide is from 2 to 4 grams by mouth every four hours in conjunction with the administration of penicillin. This dosage is used whether the penicillin is given by injection or by mouth. For children



under 12 years of age or those weighing less than 85 pounds (40 kilograms), the recommended daily dose is from 0.2 to 0.4 gram per kilogram of body weight in divided doses every 3 or 4 hours. This dosage will result in an average fourfold increase of penicillin blood levels whether the penicillin is given by injection or by mouth. Thus when caronamide is used, effective blood levels of penicillin may be maintained by injecting the latter every 4 to 6 hours instead of every 2 to 3 hours as is customary at present. Obviously this will not only reduce the frequency of penicillin injections but will also decrease the amount of drug required.

If preferred, the administration of penicillin may be continued at the same time intervals (every 2 to 3 hours), but in a dosage of one-half to one-fourth of that ordinarily employed, since caronamide produces an average fourfold increase in penicillin blood levels.

#### BENADRYL HYDROCHLORIDE INJECTION . .

An antiallergic and antispasmodic agent for parenteral administration is available in 10 cc. rubber-diaphragm-capped vials containing 10 mg. of benadryl hydrochloride per cc. from Parke, Davis and Company.

Parenterally, benadryl elicits an effective response in from three to ten minutes, whereas orally it usually requires from twenty to sixty minutes. The former method of administration is, therefore, often preferred in conditions where immediate action of the drug is indicated, such as: acute asthma, serum reactions, severe an-gioneurotic edema, acute urticaria, irradiation sickness, and in certain allergic reactions occasionally encountered following administration of penicillin, liver extract, and insulin. Although benadryl solution may be injected intravenously or intramuscularly, the former route of administration is more often preferred. Local tenderness, erythema, and induration may result in patients receiving intramuscular injections of benadryl solution.

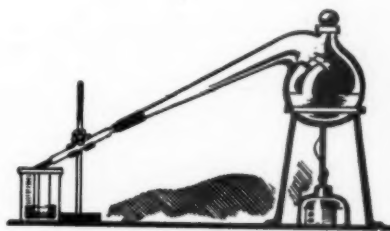
The effective parenteral dosage of benadryl, varies with different patients and with the condition under treatment. However, injection of 1 to 5 cc. of the solution representing from 10 to 50 mg. of benadryl hydrochloride has been found to be effective in most conditions in which parenteral administration of the drug is indicated. Intravenously, as much as 120 mg. has been given by continuous drip within a ten minute period. Parenteral therapy is discontinued as soon as the severity of the symptoms has diminished, and the drug is then administered orally.

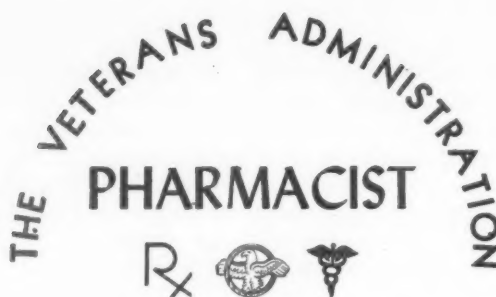
**PYRIBENZAMINE OINTMENT AND CREAM . . .** comprise a new mode for the administration of the antihistamine pyribenzamine (Tripelennamine) hydrochloride in carrying out a special therapy aimed at the relief of itching associated with various dermatoses. They have been found to be particularly effective in the treatment of atopic dermatitis and pruritus ani.

Although aqueous solutions of the drug produce similar relief, ointments have proven advantageous in that they allow more prolonged contact with the affected skin area.

A 2 per cent concentration of pyribenzamine hydrochloride incorporated in the ointment or cream is considered to produce the most favorable results and at the same time be least irritating; this concentration may produce some irritation in the treatment of a few case of dermatitis, especially those associated with acute inflammation. A stinging sensation which may occur a few minutes after application is not to be regarded as a contraindication to continued treatment.

Pyribenzamine ointment 2 per cent in a petrolatum base and pyribenzamine cream 2 per cent in a water-soluble base have been made available in 50 gram and 1 pound containers by Ciba Pharmaceutical Products, Incorporated. The preparation containing the water-soluble base is often preferred since its action is said to be quicker and more pronounced. The petrolatum base may be preferred in those conditions in which a greasy covering is desired.





EDITED BY EDDIE WOLFE, CHIEF PHARMACIST, MT. ALTO VETERANS HOSPITAL  
WASHINGTON, D.C.

BY JULIUS MEININGER  
V. A. HOSPITAL,  
INDIANAPOLIS, INDIANA

## A PHARMACY FILE

A comprehensive file of pharmaceutical data is a necessity for a hospital pharmacist. Such a file provides ready information when needed, saves time, and is a source of satisfaction to those maintaining the file and using it.

The writer has tried several systems in establishing a "Therapeutic Index" reference file, including related data, for use in a V.A. pharmacy. The following is a description of the system now in use and it is offered to other pharmacists for such utility as it may have.

The physical equipment consists of a four drawer letter size steel filing cabinet with suitable separators and a wooden filing cabinet with lid to hold three by five cards.

On the three by five cards the file notations are made. These cards are filed alphabetically according to title in the wooden file box using conventional separators. These cards bear such titles considered valuable for filing; for example, Malaria, Thiouracil, Demerol, Rutin, Gold Therapy, etc. Following the title is the name of the publication in which the article appeared, followed by the month and page. Each title card may have on it one or numerous references noted which seem pertinent regarding the indexed article.

Actual filing of catalogs (manufacturer's pamphlets, various publications and price lists) is accomplished through the use of the conventional four drawer steel file. In the top drawer publications are filed according to months, heavy dividers being used bearing a steel tab showing the month of the year. Under a particular month all publications retained appearing for that month are filed. For example, the American Pharma-

ceutical Journal, Merck Report, Therapeutic Notes, Bulletin of the American Society of Hospital Pharmacists, American Professional Pharmacist, and others containing desired information are filed under the proper month regardless of the year published. It can be readily seen that it is necessary only to consult references on three by five card to be able to locate published articles on the item sought.

The second drawer contains similar separators. In this drawer are filed manufacturer's leaflets, booklets, etc., according to the letter of the alphabet of the title, Demerol, Propylthiouracil, etc., except that titles such as "Anemia", "Sulfonamides, Therapy with", "Vitamin Therapy", etc., are filed under the latter headings. Often desired information can be obtained directly from pamphlets in this drawer without consulting reference cards.

The third drawer is separated according to the letters of the alphabet as above. Here are filed manufacturer's catalogs and price lists under the name of the manufacturer. As sometimes happens, these are not always price lists, but perhaps lists of their products with therapeutic notes. These, of course, are filed under manufacturer's name. It can be readily seen that information desired in this drawer may also be in drawer two.

The fourth drawer contains such publications which are retained that do not fit in with others because of size; for example, What's New; and it also contains collections of leaflets placed in envelopes from specific manufacturers. Room is also found in this drawer for folders holding correspondence and those bearing particular titles

such as Technical Bulletins, Circulars, Supply Data, Biological Report, Monthly Operations Report, etc.

In addition to the above, formulas, processes and other items seeming to be valuable are clipped from other sources and are pasted in a loose leaf book, called in this pharmacy "Gems of Wisdom" and kept in drawer four.

#### FREE PUBLICATIONS

During a conversation with one of the staff doctors, he raised the question of how it was possible for the pharmacist to keep himself well-informed on the many new drugs and their uses that are constantly appearing on the market. I feel sure that my answer to him will be of interest to all pharmacists, although to most of you to whom these sources of information have been available will realize that there is no mystery to being an alert and well-informed pharmacist.

From the material in the publications below, we maintain a complete drug file that is constantly being revised and therefore any required information regarding the latest drugs is at our fingertips. We earnestly recommend these publications to any of you who are not at present receiving them as valuable mediums in keeping well-informed in our profession. It may be well to suggest that you also request that your name be included on the mailing lists for any additional drug literature that may be published.

The publications listed below are gladly furnished gratuitously by the leading drug companies and you have only to place your name with them to be included on their mailing lists.

Therapeutic Notes  
Parke-Davis Co.  
Detroit 32, Mich.

Modern Pharmacy  
Parke-Davis Co.  
Detroit 32, Mich.

Professional Drug Display presented by the Winthrop Co. under the Veterans Administration policy of permitting manufacturer's exhibits of Council Accepted products. Mr. Myers, (left), Winthrop representative, discusses the properties of Avertin with Mr. Eddie Wolfe, Chief Pharmacist in the Mt. Alto Hospital Pharmacy.

Squibb Memoranda  
E. R. Squibb & Co.  
745 - 5th Ave.  
New York 22, N.Y.

American Professional Pharmacist  
Romaine Pierson  
Publishers  
67 Wall St.  
New York 5, N. Y.

Scope  
Upjohn Co.  
Kalamazoo 99, Mich.

Pharmaceutical Advance  
Menley & James  
70 W. 40th St.  
New York 18, N.Y.

Tile & Till  
Eli Lilly and Co.  
P. O. Box 618  
Indianapolis 6, Ind.

What's New  
Abbott Laboratories  
North Chicago, Ill.

Today in Pharmacy  
E. R. Squibb & Co.  
745 - 5th Ave.  
New York 22, N. Y.

Roche Review  
Hoffman LaRoche Co.  
Nutley 10. N. J.

Pulse in Pharmacy  
Wyeth Co.  
Philadelphia. Pa.

The Penicillin Reporter  
Commercial Solvents  
Corp.  
17 E. 42nd St.  
New York 17, N. Y.

Physician's Bulletin  
Eli Lilly and Co.  
P. O. Box 618  
Indianapolis 6, Ind.

Seminar  
Sharp & Dohme Co.  
Philadelphia, Pa.

The Merck Report  
Merck & Company  
Rayway, N. J.





### STREPTOMYCIN AND PENICILLIN DILUTIONS

Mr. Brumbaugh, Chief Pharmacist at the Baker V. A. Hospital in Martinsburg, West Va., has adapted the technic for diluting streptomycin and penicillin as described in a past issue of THE BULLETIN, July-August 1946, Page 126. He feels that this technique is contributing to the economy, both financially and time saving at his hospital.

The set-up with a few modifications has been entirely successful with the pharmacists using it in the Baker V. A. Pharmacy. Mr. Brumbaugh suggests the use of this dilution technique in other V. A. pharmacies due to his success with the apparatus and the ease with which it is used. The entire dilution procedure should be approved by the Committee on Therapeutic Agents.

### HOSPITAL PHARMACY MAGAZINE

The latest addition to the new professional relations program that has been instituted by the Mt. Alto pharmacists is the establishment of a magazine to be published every two months. It contains material on new drugs in stock, changes in medications and nomenclature, abstracts from medical and pharmaceutical journals, and the very latest news on medications, vitamins and narcotics.

The first issue consisted of eleven pages; the first page containing a message to the entire hospital staff. About one hundred copies of the magazine were distributed to the staff, including physicians, nurses and all the various departments in the hospital.

The magazine was indeed a success as was demonstrated by the favorable comments received the same day it was distributed and for several days afterwards. Various departments were enthused about the magazine to the extent that they asked for space in the next issue; which means that the next issue will probably carry sub-sections by the Laboratory, Research Department and the Cardio-Vascular Clinic.

The publication has proven an important step toward furthering the professional relationships between the pharmacy, the other hospital departments and the medical and nursing staffs.

Note: Approval must be obtained from your Publications Control Officer before material is released.

### SUGGESTIONS BY V.A. PHARMACISTS

The following formula has been suggested by

Mr. David Puchkoff of the Fort Custer V.A. Hospital. He states that this preparation is suitable for core plaster, pouring stone casts and boxing. The advantages are that it cuts easy after it sets, is hard enough for impression trays and is both economical and easy to prepare.

### DENTAL IMPRESSION PLASTER

Corn starch	1 1/2 lbs.
Plaster of Paris	5 lbs.

Mix powders together. Flavor or color may be added. To use, add sufficient water until a paste of smooth thick consistency is formed.

### MT. ALTO HOSPITAL PHARMACY PRESENTS PROFESSIONAL DRUG DISPLAY

Under the new program of presenting Professional Drug Displays, a schedule has been established to provide for one manufacturer's exhibit each month to be presented in the pharmacy of the Mt. Alto Hospital. The schedule as drawn up several months ago:

August	-	Bilhuber-Knoll Co.
September	-	Winthrop Co.
October	-	Burroughs Wellcome Co.
November	-	Merrell Co.
December	-	Lederle Co.
January	-	Upjohn Co.
February	-	Parke-Davis Co.

The Winthrop Co. display, measuring seven feet by eight feet, was placed at one end of the pharmacy. In attendance were two Winthrop drug representatives.

Among those attending this exhibition were the Hospital Manager, Chief Medical Officer, Chiefs of Service, thirty staff physicians, sixty nurses, laboratory technicians, various technicians from the clinics and members of the Dental Staff. Everyone who attended the display received literature of all the material displayed.

The same system was employed that worked so well at the last display. Each member of the Medical Staff received a letter through the mail inviting him to attend. Those physicians who were late in visiting the display were called by telephone by the pharmacist.

The Winthrop Professional Drug Display was complete success as evidenced by the turnout and the favorable comments received.



## CURRENT LITERATURE

### HOSPITAL MANAGEMENT

September 1947 - "How VA Pharmacies Are Organized and Methods of Operation" by E. Burns Geiger, Assistant to the Chief, Pharmacy Division, Veterans Administration, Washington, D. C. From a paper presented at the 1947 annual meeting of the A.S.H.P. - A detailed outline of pharmacy in the Veterans Administration is given including scope, organization, personnel and service, requirements and grades for pharmacists, library facilities and responsibilities of the pharmacists in the VA. page 92

"Pharmacists Told to Use Caution Handling Radioactive Isotopes" - A brief report of paper on radioisotopes presented at 1947 A.S.H.P. meeting by Albert W. Moore. page 100

"New Monthly Bulletin Published by Louisiana Hospital Pharmacists" - Announcement of publication of a bulletin on new drugs and their uses for the purpose of disseminating information to the hospital pharmacists of the Louisiana Society of Hospital Pharmacists.

October 1947 - "How Large and Small Hospitals Can Keep Proper Pharmacy Records" by Ruth C. Moote, graduate student, College of Pharmacy, Purdue University. Presented at the 1947 annual meeting of the A.S.H.P. Account based on sample records obtained from 53 hospital pharmacies. Types of records with illustrations are shown. page 88

"How the Hospital Pharmacy Can Contact Doctor, Nurse, Patient" by Herbert L. Flack, chief pharmacist, Jefferson Medical College Hospital, Philadelphia, Pa. Presented at the 1947 annual meeting of the A.S.H.P. - Professional relations in the hospital is discussed with suggestions for promoting better relations between the pharmacy and members of the hospital staff and the patient. page 96

### MODERN HOSPITAL

October 1947 - "Production Line Speeds the Dilution of Penicillin" by B. W. Mandelstam, M.D.,

Beth Israel Hospital, Boston - A detailed procedure for diluting penicillin in an economical and speedy way. Illustrations of apparatus are shown. page 92

"New Analgesic Drugs" - A review of new analgesics including metopon, demerol and amidone and its derivatives. page 94

November 1947 - "Tetra-Ethyl-Ammonium Chloride: A New Blocking Agent for Autonomic Ganglia" - A brief report on the history, chemistry, pharmacology, clinical applications, dosage and route of administration and untoward reactions of TEAB are given. page 94

### SOUTHERN HOSPITALS

October 1947 - "Pharmacy - A Professional Service" by D. O. McClusky, Jr., Administrator, Druid City Hospital, Tuscaloosa, Ala., - From a talk given at the Southeastern Hospital Conference, meeting in Biloxi, Miss. in April. - Emphasis is placed on the importance of the pharmacy to the hospital administrator, to the physician and intern and to the nurse in providing adequate professional service for the patient. page 76

"With the Hospital Pharmacist" edited by Joe Vance, South Highlands Hospital, Birmingham - Includes the following items: 'Institute Conducts Survey on Pharmacists' Salaries' - Louisiana Pharmacists Edit Current Affairs Bulletin' - Former S.H.P.A. President is Given National Post' - 'Hospital Pharmacy and the Law' - Statin-Penicillin Therapy Successfully Combats Infections' - Injection of Chemicals Aids in Distinguishing Tissues' - Pentothal Sodium Used For Rectal Administration'. page 78

November 1947 - "A.M.A. Council Frowns on Local Use of Sulfonamides" - A rebuttal to the A.M.A. council report discouraging the use of sulfonamides topically. The author points out actual cases and clinical evidence supporting continued use of the sulfonamides topically. page 74

"A Venture In Hospital Pharmacy" by Harold L. Bettis, Assistant Superintendent, Presbyterian Hospital, Charlotte, N. C. - Steps which the administration must take in the organization of the pharmacy department and the responsibilities of the pharmacist are discussed. page 75

#### AMERICAN PROFESSIONAL PHARMACIST

October 1947 - "Progress In Hospital Pharmacy" - The future of hospital pharmacy depends in great part upon the calibre of the practicing pharmacists who are trained for that field today. Qualifications for hospital pharmacists are pointed out concluding that there are unlimited opportunities for those with such training. The financial return from these is in proportion to the amount of initiative the person possesses, and to the degree of "progress" the person desires. page 923

"Hospital Pharmacy Meets" - An account of the 1947 annual A.S.H.P. meeting held in Milwaukee in August. page 924

November 1947 - "Hospital House Organs" - A brief discussion of hospital pharmacy bulletins used by hospital pharmacists to promote better professional relations and creating liaison between the pharmacy department and the medical staff of the hospital. page 1022

"Hospital Pharmacy Survey" - Information in regard to the recent survey of hospital pharmacy conducted by American Professional Pharmacist. A copy of the questionnaire is included. page 1024

#### JOURNAL OF THE A.P.H.A. PRACTICAL PHARMACY EDIT.

September 1947 - "Therapeutic Trials Committee" by Walton Van Winkle, Jr., Secretary, Therapeutic Trials Committee, Council on Pharmacy and Chemistry, American Medical Association. - How the A. M. A. serves the pharmacists as well as the physician through its Therapeutic Trials Committee is discussed. The activities of the committee are outlined. page 458

## GIFTS TO THE SOCIETY

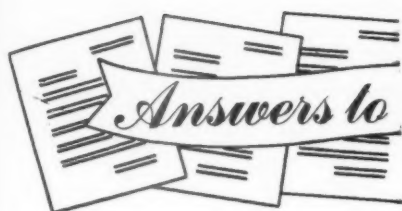
Recognizing the value of The American Society of Hospital Pharmacists and in full appreciation of its efforts to raise the level of the practice of pharmacy in hospitals, I add my support toward the achievement of these goals. I am enclosing \_\_\_\_\_ dollars for the use of the Society for the advancement of hospital pharmacy.

\_\_\_\_\_ Date  
 \_\_\_\_\_ Bank  
 \_\_\_\_\_ City \_\_\_\_\_ State  
 Pay To The Order Of **AMERICAN SOCIETY OF HOSPITAL PHARMACISTS** \$ \_\_\_\_\_  
 \_\_\_\_\_ Dollars  
 \_\_\_\_\_ Name  
 \_\_\_\_\_ Address  
 \_\_\_\_\_ Hospital or  
 \_\_\_\_\_ Affiliation

For Convenience, the above check form is furnished.

Checks sent to the Editor, 1313 Ann St., Ann Arbor, Michigan will be recorded and forwarded to the Treasurer of the Society.





EDITED BY EVELYN GRAY SCOTT, CHIEF PHARMACIST,  
ST. LUKE'S HOSPITAL, CLEVELAND

#### MELTING POINT OF VASELINE

M. D. C. of Quebec, Canada, wishes to raise the melting point of vaseline used in preparing vaseline impregnated gauze.

The petrolatum could be hardened, as I suppose that is the reason for raising the melting point, by using some variation of the following formula:

Paraffin	2%
Beeswax (white or yellow)	2%
Petrolatum (white or yellow)	96%

On page two, the U.S.P. XIII states, "Ointments - In official ointments which contain petrolatum, white petrolatum, yellow wax, or white wax, the proportions of these may be varied to maintain a suitable consistence under different climatic conditions, provided that the proportion of active ingredients is not varied."

#### ORAL STREPTOMYCIN

R. L. of Toledo, Ohio, wants information on oral streptomycin.

A brochure, published by Merck and Company, Incorporated, Rahway, New Jersey, on Streptomycin, states, under oral administration, "Streptomycin is not inactivated in the gastrointestinal tract nor is it absorbed, but is excreted in the feces virtually unchanged. Oral administration has been used to reduce the bacterial flora of the intestinal tract. For this purpose the drug may be dissolved in a small amount of water, or mixed with milk or some other acceptable fluid, since its taste is not generally considered objectionable. **WARNING:** Oral administration is ineffective in the treatment of systemic infections; streptomycin is absorbed only slightly through the gastrointestinal mucosa."

#### CAPSULE FILLING MACHINE

J. M. of Youngstown, Ohio requests the name of a company supplying a small semi-automatic capsule filling machine.

Such an apparatus may be obtained from: Precision Engineering Company, 1-3 North Carey Street, Baltimore, Maryland.

#### FILTER ADAPTERS

G. S. of New Jersey wants to know a simple method of getting airtight connections between the filtering funnel and the container.

There are filter adapters of neoprene made in a series of six types. By using these adapters singly or in combination, any fit within the size of the series can be easily obtained. The adapters may be ordered as: 5115-T Filter Adapters, Neoprene, Tapered Collar Type, Arthur H. Thomas Company, Philadelphia 5, Pennsylvania. Specifications: Complete set of six sizes. \$2.25.



5115-T. Showing Series of Six Sizes.

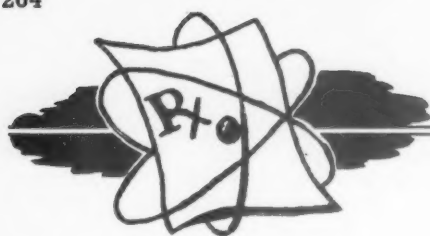
#### FILTER ADAPTERS, NEOPRENE, Tapered Collar Type,



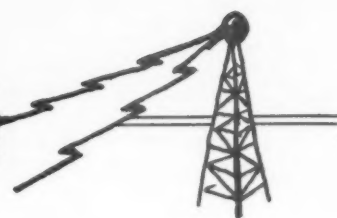
Showing a Gooch Crucible supported in a Filter Tube held in the neck of a Filter Flask.



Showing Adapter supporting a large Buechner Funnel in the neck of a Filter Flask.



## NEWS ITEMS



### A.S.H.P. ELECTION RESULTS

The results of the recent election of officers of the American Society of Hospital Pharmacists have been announced. W. Arthur Purdum of Johns Hopkins Hospital, Baltimore, Maryland is president-elect. Dr. Purdum, as president-elect, is also a member of the Policy Committee of the Division of Hospital Pharmacy. Chosen vice-president-elect is Geraldine J. Stockert of Monmouth Memorial Hospital, Long Branch, New Jersey. J. R. Cathcart of the West Chester Hospital, West Chester, Pennsylvania was selected secretary-elect. The new treasurer-elect is Sister Jeanne Marie of St. Elizabeth's Hospital, Youngstown, Ohio. These officers will be installed at the annual convention to be held in San Francisco the week of August 8, 1948.

The ballots were counted by a committee of three A.S.H.P. members appointed by President Zugich. Included on the committee were Mr. Irvin Friesen, Washington Sanitarium, Takoma Park, Md., Sister Lydia Spain, Providence Hospital, Washington, and Miss Gloria Niemeyer, Washington.

The membership also voted to amend the Society's Constitution and By-Laws to change the title "Chairman" to "President" and "Vice-Chairman" to "Vice-President".

The present officers of the American Society of Hospital Pharmacists who will continue to function until the San Francisco convention in August are:

President . . . John J. Zugich, New Haven, Conn.  
Vice-President . . Margaret S. Gary, Norfolk, Va.  
Secretary . . . Leo F. Godley, New York City  
Treasurer . . Sister Etheldreda, Brooklyn, N.Y.

### CLARKE ELECTED TO POLICY COMMITTEE



The Executive Committee of the American Society of Hospital Pharmacists has announced the selection of Mr. Donald A. Clarke to membership on the Policy Committee of the Division of Hospital Pharmacy to replace Mr. Don E. Francke, recently resigned. Mr. Clarke, a graduate of the

Philadelphia College of Pharmacy and Science, is apothecary-in-chief at The Society of the New York Hospital. He is also research fellow at Cornell University Medical College, Department of Pharmacology and a member of the Pharmaceutical Survey Committee. The author of several articles pertaining to the practice of pharmacy in hospitals, and related subjects, Mr. Clarke has made many contributions to his profession.

The members of the Policy Committee now include: John J. Zugich, president of the Society; W. Arthur Purdum, president-elect of the Society; Donald A. Clarke of the New York Hospital and Evelyn Gray Scott of St. Luke's Hospital, Cleveland, both representing the Society. Representing the American Pharmaceutical Association are Robert P. Fischelis, and Dean E. R. Serles of the University of Illinois School of Pharmacy. Mr. Worth L. Howard, executive director of City Hospital, Akron, Ohio represents the American Hospital Association. The Catholic Hospital Association is represented by Sister Clara Francis, chief pharmacist of St. Joseph's Hospital, Memphis, Tennessee.

### HANSEN APPOINTED ADMINISTRATOR OF GRANT HOSPITAL



Hans S. Hansen, formerly chief pharmacist at Grant Hospital, Chicago, and past-chairman of the American Society of Hospital Pharmacists has been appointed administrator of Grant Hospital. Mr. Hansen's many friends in the Society unite to extend to him their sincere congratulations and best wishes for continued success.

### PRESIDENT DRETZKA ADDRESSES HOSPITAL PHARMACISTS

Sylvester H. Dretzka, president of the American Pharmaceutical Association spoke at a meeting of the Wisconsin Society of Hospital Pharmacists recently at the Milwaukee Children's Hospital. Mr. Dretzka urged the pharmacists to

maintain rigid control over their stock of medicinal agents to prevent dangerous drugs from falling into the hands of the inexperienced.

#### STEPPIG HEADS PHARMACY BOARD

Oliver J. Steppig, chief pharmacist at Alexian Brothers Hospital, St. Louis, Missouri has been elected president of the Missouri Board of Pharmacy. Mr. Steppig has been a member of the Board of Pharmacy since 1945.

#### HANSEN APPOINTED TO COMMITTEE

Hans S. Hansen, formerly chief pharmacist and now administrator of Grant Hospital, Chicago has been appointed a member of the Committee on Status of Pharmacists in Government Service. Mr. Hansen is the first hospital pharmacist selected to serve on this committee.

#### SOUTHEASTERN HOSPITAL PHARMACY ASSOCIATION TO PRESENT OUTSTANDING PROGRAM IN ATLANTA MEETING

Hospital Pharmacists who attend the preliminary meeting of the Southeastern Hospital Pharmacy Association, January 17 and 18 in Atlanta, Georgia, may expect an instructive and entertaining time of it. The speaker's agenda includes such outstanding pharmaceutical figures as Paul T. Rees, former Commander in the Naval Hospital Corps; Grover C. Bowles, outstanding educator of the school of Pharmacy, University of Tennessee; Charles E. Wilson, president-elect American College of Apothecaries, from Corinth, Mississippi; Frank Thompson, chief pharmacist, Touro Infirmary, New Orleans, Louisiana; Sister Clara Francis, chief pharmacist, St. Joseph Hospital, Memphis, Tennessee; and Joe Vance, chief pharmacist, South Highlands Infirmary, Birmingham, Alabama.

John J. Zugich, president, American Society of Hospital Pharmacists, and former president of the Southeastern group, has tentatively planned to attend the Atlanta meeting and speak, according to Alberta Evans, secretary-treasurer, of the S.H.P.A.

D. O. McClusky, Jr., one of the founders of the Association and past-president, who is now administrator of the Druid City Hospital, Tuscaloosa, Alabama, is also expected to attend and participate in the meeting.

Albert P. Lauve, Mercy Hospital, New Orleans, is chairman of the program committee; Joyce Gaines, Georgia Baptist Hospital, Atlanta, is

chairman of the local arrangements committee.

Anna D. Thiel, president of the Association, expects a record turnout for the meeting. Mr. Joyce Gaines announces tentative arrangements for the program which call for Registration Saturday, January 17, at 12:00 noon at Piedmont Hotel. Beginning at 2:00 P.M. a tour of Emory University Hospital, sponsored by Hoffman La Roche and conducted by assistant administrator Barton. The speakers will be presented Saturday night and Sunday morning. Dinner Saturday night and breakfast Sunday morning will be sponsored by the Upjohn Company, and the William S. Merrell Company.

#### STATUS OF PHARMACISTS IN V.A. HOSPITALS

Recently the question has been raised as to the status of pharmacists who have been employed in the Veterans Administration over long periods and who came into the Service before Civil Service placed pharmacy in the professional classification.

Among the pharmacists in the Veterans Administration there are graduates of the two-year pharmacy course, the three-year pharmacy course, and the four-year pharmacy course. Only graduates of the four-year pharmacy course receive the degree of Bachelor of Science, and the regulations now require that the possession of a Bachelor of Science degree shall be the minimum educational requirement for pharmacists entering the Civil Service as pharmacists. The question has arisen as to the effect of this standard on pharmacists already employed in the Veterans Administration, with permanent Civil Service status and with temporary Civil Service status.

In order to explore this situation and to be in a position to give definite information to its members, the American Society of Hospital Pharmacists arranged for a conference with Dr. W. Paul Briggs, Chief of the Pharmacy Division of the Veterans Administration, and this conference was held on November 19 and was attended by Chairman Einbeck of the joint Committee on Status of Pharmacists in the Government Service, Mr. Eddie Wolfe, Chairman of the Committee on Status of Pharmacists in the Government Service of the A.S.H.P., Mr. John Zugich, President of the A.S.H.P., Mr. George F. Archambault, Chief of the Pharmacy Service, Hospital Division, U.S. Public Health Service, Dr. Briggs and Mr. Geiger of the Veterans Administration, and Dr. Robert P. Fischelis, Secretary of the American Pharmaceutical Association.

Dr. Briggs clarified the status of pharmacists in the Veterans Administration for the members of the conference, and it was agreed that a bul-



letin would be issued by the American Pharmaceutical Association for the purpose of supplying essential information on this subject to those concerned.

The following information was developed at the conference.

1. Veterans Administration pharmacists with permanent Civil Service status as of January 3, 1946, were transferred in-grade to the new Department of Medicine and Surgery of the Veterans Administration. Thus, their grade and permanence were protected by Public Law 293. This means that pharmacists who have permanent Civil Service status in any of the professional classification, will retain that status whether they are Bachelors of Science in Pharmacy or not.

2. Pharmacists in the Veterans Administration with a Civil Service status other than permanent, may not reach a permanent status in the classification which they now hold, if such pharmacists are not in possession of a Bachelor of Science degree. The status of this group depends upon the general employment situation and the requirements of the Service.

3. New appointments as pharmacists in the Veterans Administration will be made from applicants who possess the necessary quali-

cations for admission, which include the Bachelor of Science degree.

4. The Congress having established the Bachelor of Science degree as the desired minimum educational standard for pharmacists and the Administrator having determined that experience cannot fulfill the intent of Congress, the Bachelor of Science standard must prevail for appointment purposes. Under Civil Service policy all promotion standards must be identical with appointment standards. While persons who are already employed under permanent Civil Service will not be affected by the Bachelor of Science requirement as far as the security of their status is concerned, their advancement will be limited to in-grade promotion. Annual in-grade salary increases rise to the amount of the base pay of the next higher grade.

It was the consensus of the members of the conference that on the basis of the ultimate welfare of war veterans, the advancement of pharmacy in the government service should not be hampered in any way and that the provision for advancement of those already in the Service was fair and equitable in the light of the advancement of pharmaceutical standards in the government service as a whole.

## Election Bulletin

The results of the recent election of officers have been announced by the American Pharmaceutical Association. Chosen president-elect is Ernest Little, educator, of Newark, New Jersey. The first-vice-president-elect is Mearl D. Pritchard, practicing pharmacist of Buffalo New York. Frederick D. Lascoff, retail pharmacist of New York City is second-vice-president-elect. Hospital Pharmacist Hans. S. Hansen of Chicago is member-elect of the Council for a term of one year. Members-elect of the Council for three year terms are Martin E. Adamo, retail pharmacist of Boston; Don E. Francke, hospital pharmacist of Ann Arbor, Michigan; and Robert L. Swain, editor, of New York City.

The terms of office of the elected individuals will begin in August 1948. The present officers of the Association will continue to serve until that time.



Ernest Little



Mearl D. Pritchard



Frederick D. Lascoff



Hans S. Hansen



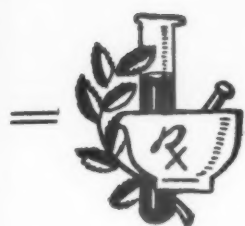
Martin E. Adamo



Don E. Francke



Robert L. Swain



# ORGANIZATION NEWS



Edited by HERBERT L. FLACK

CHIEF PHARMACIST, JEFFERSON MEDICAL COLLEGE HOSPITAL, PHILADELPHIA

**THOUGHTS FOR THE MONTH** - Plan now for the future. On page 269 of this issue, there is a listing of regional and state hospital association meetings. Every affiliated organization of the A.S.H.P. can attempt to participate in these meetings. By sponsoring a display, dispensing information, and holding a Pharmacy Section meeting as a part of these state or regional meetings, the various hospital pharmacy groups can collectively contribute to the increasing of the standards and prestige of hospital pharmaceutical practice.

The Convention Committee of the A.S.H.P. is prepared to suggest and assist with a typical program for the Pharmacy Section and to furnish materials for, and assist with the presentation of an exhibition or display which you as a member group of the A.S.H.P. will sponsor.

**TYPICAL PROFESSIONAL TYPE PROGRAMS** - can be gleaned from this and previous issues of the Bulletin's Organization News. This thought is suggested to Program Chairmen of the local hospital pharmacy groups in an effort to present programs that are concerned with our problems as hospital pharmacists. We must discuss our varied problems and obtain benefit from the fact that, as a group, we can easily obtain different opinions on a subject or different methods for accomplishing a given point.

It is only too easy for the Program Chairman to ask any one of the pharmaceutical companies to present a movie or talk on a specific product of that company. I do not criticize this practice as being wrong, for much benefit can be obtained from such films or talks presented by experts on the subject. I do recommend that such programs be held to a minimum and that the majority of programs be presented on subject that directly influence the practice of Pharmacy in the hospital. As examples, I submit the following subjects:

1. Narcotic, barbiturate, and dangerous drug control, to include legal aspects and accepted

methods for control by the hospital pharmacist - have each member display forms used by him for such control - invite your nursing, intern, and resident staffs to the meeting.

2. Alcohol control - include legal aspects and accepted methods for control by the hospital pharmacist.

3. Blue Cross (A.H.S.) methods for payment of member's hospital drug bills - a joint meeting with hospital administrators or business managers - talk given by representative of Blue Cross.

4. Modern Drug Therapy - joint meeting with local A.Ph.A. group - to include talk by the dean or professor of medicine of a medical school and follow through by a hospital pharmacist on value of a formulary system in maintaining modern drug therapy.

5. A professional relations meeting with hospital administrators, the local A.Ph.A. group, and retail pharmacists invited. Various speakers would present the following: The Administrator Views Hospital Pharmacy, The Educator's Responsibility to Hospital Pharmacy, The American Hospital Association Views Hospital Pharmacy, The Pharmacist in a Small Hospital, Hospital Pharmacy and the A.Ph.A., The Pharmacist Views Hospital Management. Such a program will present vital facts to administrators on what to expect from their hospital pharmacy, will give the hospital pharmacists an idea of their responsibility to the hospital, and will show all present the increasing importance of a high-type pharmaceutical practice in the hospital. It might also impress the retail pharmacist with the fact that hospital pharmacy is as important as retail, and that it is true pharmacy, practiced on a professional level. This last point might easily be proven if the meeting is held in the hospital with the most progressive pharmacy, and if a tour of the pharmacy is a part of the program.

**CONGRATULATIONS** - to the Cleveland Society of Hospital Pharmacists for not only presenting

hospital. Pharmacy on a high professional level but for offering a substantial contribution to the furtherance of pharmaceutical education. (see News of this group).

**A WELCOME HAND** - is extended to the following groups which are new to these pages (including September-October issue):

- \*Maryland Association of Hospital Pharmacists
- \*Maine Association of Hospital Pharmacists
- \*New York State Hospital Pharmacist Association
- \*Midwest Association of Sister Pharmacists

\* Presently in process of organization.

**HOSPITAL PHARMACISTS ASSOCIATION OF SOUTHERN CALIFORNIA** - met 26 September for dinner and for a lengthy discussion on affiliation with the A.S.H.P. members were appointed to draft constitution, by-laws, and obtain national affiliation.

**MARYLAND ASSOCIATION OF HOSPITAL PHARMACISTS** - met on 11 November in Baltimore at the meeting of the Maryland - District of Columbia Hospital Association. Mr. J. Solon Morrell spoke on "The Pharmaceutical Survey" and Mr. Alexander M. Milne, Pharmacy Specialist, Division of Hospital Facilities, U.S.P.H.S., spoke on "Hospital Pharmacy Facilities." A panel discussion, "Time Savers For The Hospital Pharmacist" was led by Mr. Frank J. Gregorek, Assistant Pharmacist, Johns Hopkins Hospital.

**MAINE ASSOCIATION OF HOSPITAL PHARMACISTS** - is in its formative stages. All hospital pharmacists in the State and nearby are requested to contact Mr. Theodore R. Tibbetts, 128 Grove St. Augusta, Maine, for further information.

**MICHIGAN CHAPTER OF THE A.S.H.P.** - met at Hurley Hospital in Flint to be the guest of Mr. William Klein, Hospital Superintendent, and Mr. Lawrence Lyon, Chief Pharmacist. Dr. Leslie Lambert, former Medical Corps Major, spoke on his experiences with sanitation and health control measures while hunting quinine in Bolivia. A tour of the pharmacy, now being enlarged, concluded the evening - 51 persons present.

**NEW JERSEY SOCIETY OF HOSPITAL PHARMACISTS** - met 16 October at the New Jersey College of Pharmacy in Newark. Election of officers and other business transpired - 14 members present.

**BUFFALO CHAPTER OF THE A.S.H.P.** - met on 15 October at Buffalo General Hospital. Students from the local Pharmacy school were welcomed and plans laid for future programs aimed to interest them in hospital Pharmacy.

**GREATER NEW YORK CHAPTER OF THE A.S.H.P.** - met 17 September at New York Foundling Hospital. Sr. Donatus, as new chairman, presided. Sr. Etheldreda spoke on the Hospital Pharmacy Sections of the recent A.Ph.A. Convention. Sr. Jeanette spoke on the Catholic Hospital Convention. - two new members - 26 members present.

The October 15th meeting was at Seton Hospital. Sr. Angeline accounted for the Chicago Institute on Hospital Pharmacy. A heated discussion of the new barbiturate law concluded the meeting. - 4 new members - 23 members present.

On 19 November the meeting was at Mary Immaculate Hospital, Jamaica, with Sr. Jeanette as host. Herbert L. Flack spoke on "Professional Relations" and Sr. Jeanette thru her professional display in the doctor's cloakroom, provided an excellent example of how professional relations can be carried out.

**NEW YORK STATE HOSPITAL PHARMACIST ASSOCIATION** - in process of formation. Interested parties should contact Miss Edith Bactowsky, Albany Hospital, Albany, or Mr. Herbert Wright, Crouse Irving Hospital, Syracuse, as soon as possible.

**CLEVELAND SOCIETY OF HOSPITAL PHARMACISTS** - met at Fairview Park Hospital on 29 October to hear Dr. Robert M. Mattocks, a professor at Western Reserve University College of Pharmacy and Director of Products Control at University Hospital, speak on hospital manufacturing and the need for proper control. The Society voted to make a pledge of \$500 towards the building fund for the new School of Pharmacy at Western Reserve University.



**PHILADELPHIA HOSPITAL PHARMACIST ASSOCIATION** - on 21 Oct. met at Jefferson Medical College Hospital for a meeting sponsored by the Philadelphia Branch of A.Ph.A., the Philadelphia Hospital Association, and the Philadelphia Purchasing Agents Group. Following a tour of the Pharmacy, views on hospital pharmacy were given from the point of the Hospital Administrator, The Pharmaceutical Educator, The A.H.A., and the A.Ph.A. The pharmacist's views on management were also presented.

Speakers were: Dr. H. R. Hamrick, Jefferson Medical College Hospital, Dr. J. C. Doane, Jewish Hosp., Dean L. F. Tice, Philadelphia College of Pharmacy and Science, Mr. J. R. Cathcart, Chester County Hospital, Dr. R. P. Fischelis (in absentia) represented by Dr. Madeline Holland, Philadelphia A.Ph.A. Branch President, Miss Estelle Kiszonas, West Jersey Hospital, Miss Gloria Niemeyer of the Washington A.S.H.P. office was a welcome guest. - 126 persons present.

The 18 November meeting was held at Pennsylvania Hospital and Mr. Warren Austin of Reading Hospital, presented a round table discussion on narcotic and barbiturate control. Nurses and physicians were present as guests of the members - 111 present.

**WISCONSIN HOSPITAL PHARMACISTS' ASSOCIATION** - met 14 November at Children's Hospital, Milwaukee, to see a film on "Caudal Anesthesia" and to hear Dr. Robert Wynn speak on "Plastic Surgery in War and Peace". A discussion on narcotic drug control is planned for the immediate future.

**SOUTHEASTERN HOSPITAL PHARMACY ASSOCIATION** - to meet on 17 and 18 January 1948 at the Piedmont Hotel in Atlanta, Georgia. Registration, a luncheon, and a tour of local hospital pharmacies will occupy Saturday, with a complimentary dinner in the evening. Sunday morning will be occupied with a breakfast and business meeting at which plans will be laid for the annual convention. Hospital pharmacists from Alabama, Florida, Georgia, Louisiana, Mississippi, and Tennessee are urged to attend and take an active part in this organization's meeting.

## THE HOSPITAL CALENDAR 1948

## March 4-5-6

Texas Hospital Association, Baker Hotel, Dallas, Texas. Ruth Barnhart, executive secretary, Texas Hospital Association, 2208 Main Street, Dallas 1, Texas.

## March 15-16-17

New England Hospital Assembly, Hotel Statler, Boston, Mass. Paul J. Spencer, superintendent, Lowell General Hospital, Lowell, Mass., secretary.

## April 1-2

Kentucky Hospital Association, Phoenix Hotel, Lexington, Ky.

## April 6-7-8

Ohio Hospital Association, The Deshler-Wallick Hotel, Columbus, O. Harry C. Eader, executive secretary, Ohio Hospital Association, 1930 A. I.U. Tower, Columbus 15, O.

## April 14-15-16

Mid-West Hospital Association, Municipal Auditorium, Kansas City, Mo. Mrs. Anne Walker, executive secretary, 4401 Wornall Road, Kansas City 2, Mo.

## April 15-16

Carolinas-Virginias Hospital Conference, Roanoke Hotel, Roanoke, Va. Secretary, J. Stanley Turk, superintendent, Ohio Valley General Hospital, Wheeling, W. Va.

## April 19-20-21-22

Association of Western Hospitals, Biltmore Hotel, Los Angeles, Calif. Thomas F. Clark, executive secretary, Association of Western Hospitals, 870 Market Street, San Francisco 2, California.

## April 22-23-24

Southeastern Hospital Association, Buena Vista Hotel, Biloxi, Miss.

## April 28-29-30

Hospital Association of Pennsylvania, Bellevue Stratford Hotel, Philadelphia, Pa. John F. Worman, executive secretary, Hospital Association of Pennsylvania, State Chamber of Commerce Bldg., 222 N. Third Street, Harrisburg, Pa.

## May 3-4-5

Tri-State Hospital Assembly, Palmer House, Chicago. Albert G. Hahn, administrator, Protestant Deaconess Hospital, Evansville, Ind., executive secretary.

## May 12

National Hospital Day, founded in 1921 by Matthew O. Foley, editor of Hospital Management, 1920-1935.

## May 20-21-22

New Jersey Hospital Association, Hotel Dennis, Atlantic City, N. J.

## May 26-27-28

New York Hospital Association, Arena, Lake Placid, N. Y.

## June 20

American College of Radiology, Sheraton Hotel, Chicago, Ill.

## June 21-22-23-24-25

American Medical Association, Chicago, Ill. In 1949 in Atlantic City, in 1950 in San Francisco.

## Aug. 9-10-11-12-13

American Society of Hospital Pharmacists and American Pharmaceutical Association, San Francisco, Calif.

## Sept. 17-18

American Protestant Hospital Association, Atlantic City, N. J.

## Sept. 19-20

American College of Hospital Administrators, Atlantic City, N. J.

## Sept. 20-21-22

\*Blue Cross and affiliated medical-surgical plans, Atlantic City, N. J.

## Sept. 20-21-22-23

\*American Hospital Association, Atlantic City, N. J.

## Sept. 20-21-22-23

American Association of Nurse Anesthetists, Atlantic City, N. J.

For the time and place of the next meeting of your local chapter see the next page -

NAME OF ORGANIZATION	USUAL MEETING DAY	USUAL TIME	SECRETARY
Hospital Pharmacists Association of Southern California	Not definite	Open	Mrs. Norma Irish 445½ S. Burlington Ave. Los Angeles 5, Calif.
Florida Hospital Pharmacy Association	Meets with State Pharmacy Convention in May	Open	Alberta Evans 209 E. Marks Orlando, Fla.
Hospital Pharmacists of Chicagoland	Not definite	Open	Mabel Kettering Billings Hospital Chicago, Ill.
Louisiana Society of Hospital Pharmacists	Second Thursday of month	8:30 P.M.	Frances Pizzolato Touro Infirmary New Orleans 15, La.
Massachusetts Society of Hospital Pharmacists	Third Wednesday of Jan., Mar., May, Sept. and Nov.	8:00 P.M.	Miss Edith Hill New England Baptist Hosp. Boston, Mass.
Michigan Society of Hospital Pharmacists	First Thursday of month	8:00 P.M.	Jane L. Rogan Evan, Deaconess Hospital Detroit 7, Michigan
Hospital Pharmacists Association of Greater St. Louis	Second Tuesday of month	8:00 P.M.	Sr. Frieda Ziegler Deaconess Hospital St. Louis, Mo.
New Jersey Society of Hospital Pharmacists	Third Thursday of month	8:00 P.M.	Gabriel Roberto Hope Dell Hospital Preakness, N. J.
Buffalo Chapter of the American Society of Hospital Pharmacists	First Sunday of month	2:00 P.M.	Francis X. Sturner Buffalo General Hospital Buffalo, N. Y.
Greater New York Chapter of the American Society of Hospital Pharmacists	Third Wednesday of month	2:30 P.M.	Sr. M. Joseph St. Joseph's Hospital Far Rockaway, L. I., N.Y.
Society of Hospital Pharmacists (Metropolitan Area, New York City)	First Thursday of month	8:00 P.M.	Morris Dauer Metropolitan Hospital Welfare Island, N. Y.
Akron Hospital Pharmacists Society	Open	Open	Not known
Society of Hospital Pharmacists of Greater Cincinnati	First Wednesday of month	Open	Elizabeth Lynch William Booth Mem. Hosp. Covington, Ky.
Cleveland Society of Hospital Pharmacists	Last Wednesday of month	Open	Thomas Sisk St. Joseph's Hospital Lorain, Ohio
Toledo Society of Hospital Pharmacists	Second Tuesday of month	4:00 P.M.	Eula Smith Flower Hospital Toledo, Ohio
Philadelphia Hospital Pharmacists Association	Third Tuesday of month	7:30 P.M.	Miss Connie Ruggieri Jewish Hospital Philadelphia, Pa.
Wisconsin Society of Hospital Pharmacists	Third Friday of month	3:30 P.M.	Sr. M. Regina St. Michael's Hospital Milwaukee, Wis.
Association of Hospital Pharmacists of the Midwest	Second Saturday Bimonthly	Open	Mrs. Lucille Bendon Jennie Edmundson Hosp. Council Bluffs, Ia.
Midwest Association of Sister Pharmacists	Third Thursday Bimonthly	2:30 P.M.	Sr. M. Stephanina 1423 Chicago Rd. Chicago Heights, Ill.
Ohio Society of Hospital Pharmacists	Spring of year in Columbus with O.H.A.	Open	Rose Lenga Riverside Hospital Toledo, Ohio
Southern Hospital Pharmacists Association	Jan. 17 and 18, 1948	Piedmont Hotel Atlanta, Ga.	Alberta Evans 209 E. Marks Orlando, Fla.

**CALIFORNIA**

William R. Kennedy  
3944-12th Ave.  
Sacramento

Perry S. Matsuura  
2070 Clinton Ave.  
Alameda

Joseph A. Schick  
2072 Grove St.  
San Francisco

Capt. Oliver Steed  
Letterman Gen. Hospital  
San Francisco

**COLORADO**

Capt. William Luehrs  
Fitzsimons Gen. Hospital  
Denver

**ILLINOIS**

Sr. M. Dulciana  
207 N. Elm St.  
Centralia

Sr. Leonissa Woletz  
220 South Webster  
Decatur

**INDIANA**

Harold Jones, Assoc.  
507 Lincoln Ave.  
Alexandria

**IOWA**

Nobuko Fujiki  
828-17th St.  
Des Moines

Louis C. Zopf  
Univ. of Iowa  
Iowa City

**MASSACHUSETTS**

William E. Dudley  
U. S. Marine Hospital  
Boston

**MICHIGAN**

Charles Cassell, Assoc.  
2929 Neckel  
Dearborn

Michael Kovalcik  
7859 Concord  
Detroit

Edward Schutte, Assoc.  
258 McKinley  
Grosse Pointe Farms

**MINNESOTA**

C. A. Hartmann  
1515 Charles Ave.  
St. Paul

**MISSOURI**

R. Krummenacher  
7472 Maple Ave.  
Maplewood

**NEW YORK**

Enuphry Benishin  
24 Belfast St.  
Bath

Charles Mars  
1457 Sterling Pl.  
Brooklyn

Emanuel Lamonaca  
587 Lorimer St.  
Brooklyn

J. E. Weintraub  
2728 Webb Ave.  
Bronx

**OHIO**

Robert A. Erion  
2624 Garland Ave.  
Cincinnati

Paul D. Hilbert  
649 Probasco St.  
Cincinnati

**PENNSYLVANIA**

E. Leuallen, Assoc.  
43rd & Kingsessing  
Philadelphia

**VERMONT**

Sr. M. Immaculata  
Fanny Allen Hospital  
Winooski

**VIRGINIA**

Lloyd Dixon  
3800 Kecoughtan Rd.  
Hampton

**WISCONSIN**

E. M. Jensen  
2522 W. Capitol Dr.  
Milwaukee

**CANADA**

Kenneth Woolcock  
515 Garfield  
New Westminster, B.C.

## POSITIONS in hospital pharmacy

**POSITION WANTED**

**HOSPITAL PHARMACIST . . . . 5 years experience** organizing and operation of hospital pharmacies in Army and Veterans Administration. Prefer New York. Contact Herman Shapiro, Box 33, Veterans Administration Center, Dayton, Ohio.

**POSITION WANTED**

**MR. RICHARD W. AVERY . . .** 215 Riverside Apartments, Big Rapids, Michigan would like to obtain a position in hospital pharmacy. Mr. Avery, who will receive his bachelor of science degree from Ferris Institute in February 1948, is interested in an internship in hospital

pharmacy, or a position as a pharmacist in a hospital. Mr. Avery is married and has one child.

**POSITION WANTED**

**CHIEF PHARMACIST** of 200 bed hospital desires change of location. Experience includes one year hospital pharmacy internship plus 4½ years as chief pharmacist, which duty instruction on School of Nursing faculty. Write in care of **THE BULLETIN**.

**POSITION OPEN**

**CALIFORNIA . . . Wanted:** Pharmacist, young man for permanent position in hospital pharmacy. Good pay, no nights. Vacation and sick leave with pay. Apply Personnel Dept., Stanford University Hospitals, Clay and Webster Sts., San Francisco, California.

**OHIO . . . a position as assistant pharmacist** is open at St. Elizabeth Hospital, 1044 Belmont Avenue, Youngstown 4. The position pays \$250 per month for a 44-hour week. For additional information write to Sister M. Baptista, Personnel Director.

**NEW YORK . . . A position as chief pharmacist** is open for a well trained hospital pharmacist, preferably a former intern, at Huntington Hospital, 270 Park Avenue, Huntington, New York. The hospital is of medium size and primarily a private type institution which lends itself well for a pharmacist to develop an outstanding department. The salary will be made attractive for the person with proper qualifications. For additional information write to Mr. Paul Fleming, administrator.

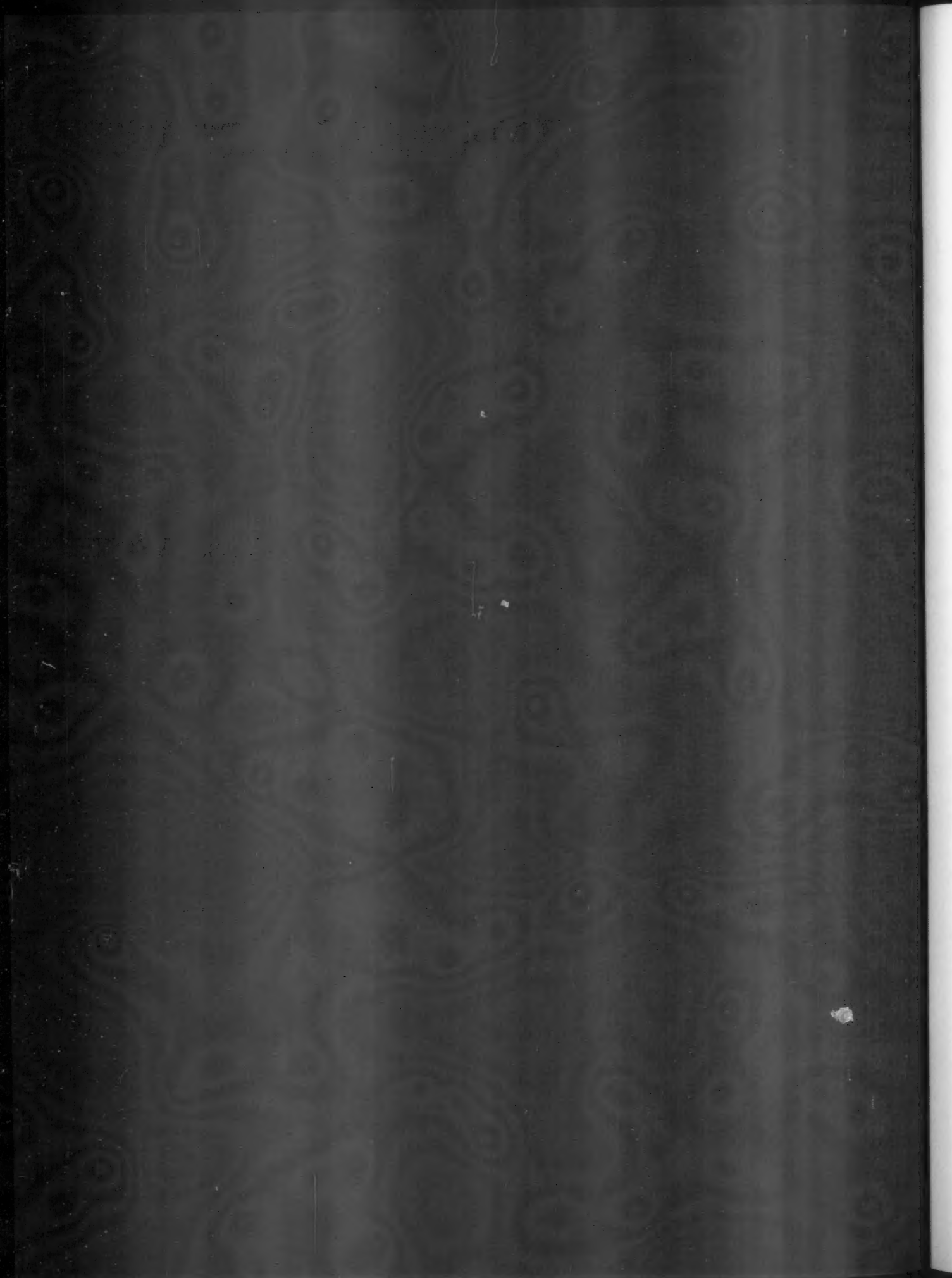




# The Hospital Pharmacy

A JOURNAL OF PERSONAL  
AND GENERAL  
PHARMACEUTICALS  
of the  
Association of  
Hospital Pharmacists

AMERICAN SOCIETY OF  
HOSPITAL PHARMACEUTISTS  
PUBLISHED BY THE  
AMERICAN PHARMACEUTICAL ASSOCIATION





## FOREWORD

This series of articles encompassing several facets of the practice of pharmacy in hospitals is reprinted from HOSPITALS by the American Hospital Association as a service to hospital pharmacy. It is believed that much of the material in these articles is basic to good hospital pharmacy practice. The fundamental principles discussed will be as timely several years hence as they are at present.

HOSPITALS is published monthly by the American Hospital Association, 18 East Division Street, Chicago 10, George Bugbee, editor, John M. Storm, executive editor, and John G. Williams, business manager.

This booklet is being sent to the more than twelve-hundred members of the American Society of Hospital Pharmacists by the American Hospital Association.

I cannot let this opportunity pass to express to Mr. John M. Storm, executive editor of HOSPITALS, and to the American Hospital Association my sincere appreciation for their wholehearted cooperation in this, and other, projects related to the practice of pharmacy in hospitals. Also to the several contributors I wish to acknowledge my appreciation for their part in making this series of articles a reality.

Evlyn Gray Scott  
Coordinator

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# *Lengthening Shadow of the* HOSPITAL PHARMACIST

NOTE: As an aid in making plans for the hospital pharmacy, a series of articles to be published in the following months will discuss the parts that go to make up an adequate service for the patient and the hospital. The articles are written with the administrator in mind, and will seek to remove the aura of mystery surrounding the department—emphasizing the fact that sound administration and professional policies will lead to a rational and economical therapeutic service.

Each article is written by a pharmacist or administrator who has had experience with the subject he is discussing. The material has been assembled from hospitals in scattered parts of the country to show that the hospital pharmacy aims of good therapeutic care at the lowest feasible cost and the promotion of a good teaching program have the same basic foundations everywhere. Mrs. Evelyn Gray Scott, chief pharmacist, St. Luke's Hospital, Cleveland, is coordinator of the series.

HOSPITAL PHARMACY is today as distinct a specialty in the field of general pharmaceutical practice as roentgenology, pathology or clinical chemistry are specialties in the broad field of medical practice. Specialties must be practiced by specialists if they are to be practiced economically, efficiently and well. To the hospital administrator these statements should mean that, if his hospital is to be rated as modern, efficient and well conducted, he must provide adequate physical equipment for the practice of pharmacy in a suitable location within the hospital, and he must give preferred attention to acquiring suitable personnel—in other words, practitioners who can qualify as experts in hospital pharmacy.

The difference between a well equipped, properly staffed and well conducted pharmacy and one which relies on poorly qualified personnel operating in a remote section of the basement—furnished with equipment of the vintage of a past generation—is as great as the difference between the modern surgeon carrying on in a recently equipped operating room and the general practitioner of the last century who used the makeshift equip-

ment of the days preceding Lister.

Partly because hospital pharmacists as a class have not been good salesmen of their professional ability and partly because the hospital pharmacy, and all it represents, has been taken for granted in the hospital organization, administrators have not given as much attention to the planning for this phase of hospital service as they might have done had they been aware of the progress in pharmaceutical education and techniques which has taken place in recent decades.

Today there is no longer any excuse for lack of knowledge of what a well planned, well staffed, well conducted and well regulated pharmacy means to the hospital organization in general, because there is sufficient evidence in many of our finest institutions of the con-

tribution which the hospital pharmacist and the hospital pharmacy make to the management of the institution as a whole.

There are also some examples of what a hospital pharmacy should not be and in most instances the difficulty can be traced directly to the hospital pharmacist in charge. The blame also may fall on the superintendent—who either does not support his pharmacist in developing suggestions for improvement, or is willing to put up with mediocre service because he does not know any better, or is lulled into a sense of false economy because he fails to study the situation in all its aspects.

In 1937 the Committee on Pharmacy of the American Hospital Association submitted a report which may well be termed a classic in its field. A rereading of this report will indicate that, although considerable progress has been made in many hospitals since the report was submitted, many of the shortcomings which were pointed out still exist and many of the recommendations have gone unheeded. This report concluded that pharmacy is a highly specialized medical service and suggested a system of rating hospital pharmacies. So far as I know, this recommendation has never been carried out, but there has been an increasing interest on the part of state boards of pharmacy in the licensing of hospital pharmacies that, in turn, has made an inquiry into personnel and equipment a routine procedure.

Unfortunately, the requirements of state pharmacy acts can be met without very great difficulty. If the pharmacist in charge is licensed by the state and if the pharmacy can show the minimum equipment set forth in the standards promulgated by the board, a license is granted. The occasional routine official in-

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spectations will not result in any great improvement in hospital pharmacy service because the ordinary inspector lacks the ability to make a study of the relationship of the specific pharmacy to the character of the service it should render.

The real test of a hospital pharmacy is not mere compliance with the minimum requirements for licensure, but whether the medical staff and the patients are receiving the maximum service of which a well equipped and well staffed pharmacy is capable. Obviously the best knowledge of the capabilities of pharmacists is possessed by pharmacists themselves.

In the selection of personnel for medical and auxiliary medical staffs, the hospital administration is careful to inquire into the educational background, special accomplishments, training and personality of the individual under consideration.

In selecting a hospital pharmacist, the administration has often been compelled to rely upon the recommendations of any available source of information. The result has been that the position of hospital pharmacist is frequently held down by a retired retail druggist or someone who has not been particularly successful in other fields of pharmaceutical endeavor. In recent years the supply of trained pharmacists has not been too plentiful. There have been opportunities for pharmacists to enter upon careers which were much more remunerative than the offers made by hospitals, and it might as well be understood by those in charge of hospital administration that the days of low salaried pharmacists willing to work long hours and without janitorial and other non-professional help are no longer with us.

Fortunately, we have hospitals throughout the country in which the hospital pharmacy is a show place as well as a source of great comfort and service to the medical staff. In such places one will invariably find a conscientious, trained, informed and capable pharmacist who looks upon his specialty with as much pride and intense interest as does the successful head of any other division of the hospital's activities.

What hospital administrators



THE AUTHOR is secretary and general manager of the American Pharmaceutical Association, having assumed that post last January 15. Prior to that time he was director of the Division of Drugs, Chemicals and Health Supplies in the War Production Board's Office of Civilian Requirements.

must recognize is that the pharmacist of 1945 is a well educated individual. He has completed a college course leading to the degree of bachelor of science in pharmacy which has included an education in the basic sciences fundamental to medicine as well as pharmacy. He has specialized in pharmaceutical chemistry and pharmacology which places him on more intimate terms with the structure and therapeutic action of the compounds now being used successfully in the treatment of disease than any other member of the hospital staff.

In a well conducted hospital this fact is recognized and the pharmacist takes his place at staff meetings for the purpose of supplying the specialized information he possesses. He, likewise, becomes a member of the teaching staff in the nurses' training school and he makes himself generally useful in all phases of hospital administration which are concerned with the procurement and economical use of drugs, medicines and hospital supplies.

Hospital pharmacists have not yet formed a specialty board before which they can qualify as specialists in the same sense that those who practice the various specialties in

surgery and internal medicine now qualify. Some planning along this line is under way however, and the day may not be far distant when hospital administrators will be in a position to ask pharmacists for credentials beyond the state license to practice. Pending the development of a specialty board which will certify hospital pharmacists, as the American College of Hospital Administrators certifies men in the field of administration, there are some special qualifications which may be demanded in order to assure better than average service in the hospital pharmacy.

These qualifications include: (1) graduation from an approved four-year course in pharmacy, (2) a record of postgraduate training and experience under competent hospital pharmacists in hospital pharmacies which are recognized as superior, (3) membership in the American Society of Hospital Pharmacists, which carries with it membership in the American Pharmaceutical Association, and (4) a record of publications or contributions to pharmaceutical literature or to the formularies of hospitals in which the applicant has been engaged.

One important test of the ability of a hospital pharmacist to meet present requirements and standards of service is the aptitude to disseminate information to the medical staff on the relative merits of different brands of the same basic drugs. It is a well known fact that ordinary prescription compounding today does not involve wrestling with incompatibilities such as were met in the days of prescriptions calling for shotgun mixtures. The trend for some time has been in the direction of single drug remedies. However, the preparation of dosage forms of these drugs still calls for exercise of the art of the apothecary and the skilled modern pharmacist has lost none of that art and has acquired new methods and new equipment for improving upon that art.

When a new basic drug such as penicillin or the sulfonamides, for example, comes upon the scene, there is considerable opportunity for experimental activity with various dosage forms at the bedside. If the pharmacist is informed of the



theory of administration he can be counted upon to furnish the dosage form which will support the theory.

In addition to all of this, he is also in a position to act as the middle man between the scientists in the laboratories who develop new and improved medicaments and the busy physician who wishes to apply the fruits of chemical and pharmacological research to treatment and prevention of disease. As one prominent pharmaceutical manufacturer has put it: "The pharmacist becomes less the compounder and more the counselor."

Hospital administrators who fail to provide their institution with a pharmacist who can act in this capacity and who neglect to make use of the latent knowledge, experience and ability which reside in the hospital pharmacist are lowering the management efficiency of the hospital quite seriously.

The American Pharmaceutical Association and the American Hospital Association both have a duty to perform in this connection. The former should take particular pains to make known the qualification of the modern pharmacist and assist in the adoption of a sound procedure of certification of those who possess special competence in this field. The American Hospital Association should continue to aid, as it is now doing, in keeping hospital administrators aware of the progress that has been made in the development of hospital pharmacy in recent years.

Between these two organizations and the American Society of Hospital Pharmacists, sufficient stimulation should result to hasten the day when all concerned may reap the benefit of the higher educational program. This program includes training facilities opened to prospective hospital pharmacists in schools of pharmacy, in hospital pharmacies operating under the fellowship plan and by means of publications and forums for the discussion of hospital pharmacy problems.

Hospital administrators and physicians, as well as other members of the technical staff, doubtless have laid awake nights thinking and planning for that better type of health care which is increasingly demanded of the modern hospital. It may be news to some, but it is

well known among pharmacists, that leaders in the profession and particularly in the field of hospital pharmacy have also lost some sleep in their endeavor to plan wisely for the improvement of pharmaceutical services and the quality of their products.

These leaders visualize the practice of pharmacy in the hospital not as a routine technical function but rather as a consulting function which implies the use of the personnel of the pharmacy in determining the best therapeutic agents available for the treatment of particular ailments and the best manner of administering these agents. Given the combination of a physician who is not loath to discuss the problems of proper therapy with a pharmacist whose college training, helpfulness and general demeanor encourage such consultation, we have an ideal situation which serves both the patient and the hospital.

These leaders also visualize the hospital pharmacy as an important factor in research on the proper use of drugs. Such research includes determining the relative efficacy of two or more drugs available for the treatment of the same ailment; the respective advantage of various types of ointment bases; the relative absorption of different types of preparations used internally; the relative ease of administration of drugs in various dosage forms.

These leaders visualize the hospital pharmacist as the consultant in the purchase of drugs and medical supplies because the competent

pharmacist knows the drug market and has his eye on the production of the funds of the hospital insofar as wise expenditure for drugs is concerned.

They visualize the hospital pharmacy as capable of limited manufacturing without going to unnecessary extremes. The capable pharmacist is in a position to determine when it is and when it is not economical to go into large scale production. They also visualize the hospital pharmacist as an aid in the education of nurses and interns.

In short, the representatives of organized pharmacy visualize the hospital pharmacy as a well integrated unit within the hospital organization which functions efficiently in its own specialty but keeps its eye on the welfare of the organization as a whole.

Just as hospitals attract patients because of their reputation for good management, adequate and modern accommodations and high quality of service, so competent pharmacists are attracted to institutions which display a liberal policy toward modern procedures, pleasant relations between management and personnel and a fair remuneration for professional services.

Good pharmacists are scarce but the supply is constantly being augmented. They will naturally gravitate to those institutions and agencies where their services are appreciated and opportunity is provided for the development of both specialty and specialist.

### AN ECHO OF THE PAST: 1907

"GOOD ORDERLIES and how to keep them are questions that we have struggled with before. In some of our county and state institutions orderlies are compelled to take civil service examinations. In our hospital they are entirely under the supervision of the nursing department, the superintendent of nurses having the authority to hire and discharge.

"We have less trouble since adopting this plan. I suggest hiring green men at twenty dollars a month

and board, training them in your own way and increasing their pay as they become proficient in the work. If they adapt themselves to the work, and are studious, we should assist them to do special nursing after a service of not less than three years."—From a paper presented by the late Asa Bacon, then superintendent of Presbyterian Hospital, Chicago, as reported in *Transactions of the American Hospital Association*; ninth annual conference, Chicago, (1907).

# Put the Pharmacy in a CENTRAL LOCATION

WITH the prospect of federal aid for construction, the hospital administration should give careful consideration to the needs of the pharmacy department. Too often in the past little attention was given to the importance of the pharmacy in the hospital with the result that it was, apparently, tucked away in some inaccessible place in the basement.

It is desirable, first of all, to evaluate carefully the need for a pharmacy department and the service that it renders before the location and space is decided on. This department is essential to the efficient operation of a hospital. Just as the removal of a single spark plug in an engine results in inefficient and ineffective performance of that engine, the hospital cannot function efficiently and effectively without the pharmacy.

The surgeon is dependent on the pharmacy for the preparation of germicidal solutions, anesthetics and other medications. Without the services of the pharmacy in supplying drugs for the outpatient department, for emergency conditions and for the patients, the hospital could not function. The laboratory obtains chemical reagents from the pharmacy and likewise the blood bank, x-ray and even the dietary departments depend on it for chemicals and various forms of medications.

With these thoughts in mind, the amount of traffic between the pharmacy and various departments must be considered carefully before deciding on the location. The pharmacy should be located so that the minimum of traffic is necessary and the greatest convenience is offered the departments serviced most frequently. Too many hours are wasted each day by nurses and attendants in traveling between the pharmacy and their stations.

## S. W. MORRISON

CHIEF PHARMACIST, WESLEY MEMORIAL HOSPITAL, CHICAGO

A central location for the pharmacy is important. Many recent hospital plans provide for tall buildings instead of the long rambling type. This design eliminates many employee hours per day of traffic and provides greater convenience.

In a tall building housing 400 to 500 beds, the pharmacy probably can be best located on the third or fourth floor. Adjoining areas on these floors most likely will house the outpatient department, laboratory, x-ray department and central sterile supply department. The floor immediately above most likely will be devoted to the surgery and fracture rooms.

### Provide Rapid Service

With such an arrangement, the pharmacy is located in the center of the activities, and will be called upon to serve frequently. This type of central location should provide the most rapid service and require a minimum amount of time and help to carry out the work.

In a smaller hospital the pharmacy may be best located on the first floor. (See the suggested plan for a 200-bed hospital on the next pages.) While it is desirable to place the manufacturing room, parenteral solution room and drug storage space immediately adjoining the dispensing pharmacy because of the greater convenience, this plan may be varied when first floor space is at a premium.

Since the basement is undesirable

for a pharmacy, this variation would best place the dispensing pharmacy on the second floor with the manufacturing room, parenteral solution room and drug storage space on the first floor immediately below the dispensing pharmacy. These rooms would be connected to the dispensing unit by the dumbwaiter which would also extend to nursing stations on the patient floors. If necessary, the location of the pharmacy rooms may be reversed with the dispensing unit placed on the first floor.

As a time saving device the two levels may be connected with a spiral steel staircase if the pharmacy is not located close to a main staircase and if local ordinances do not prohibit.

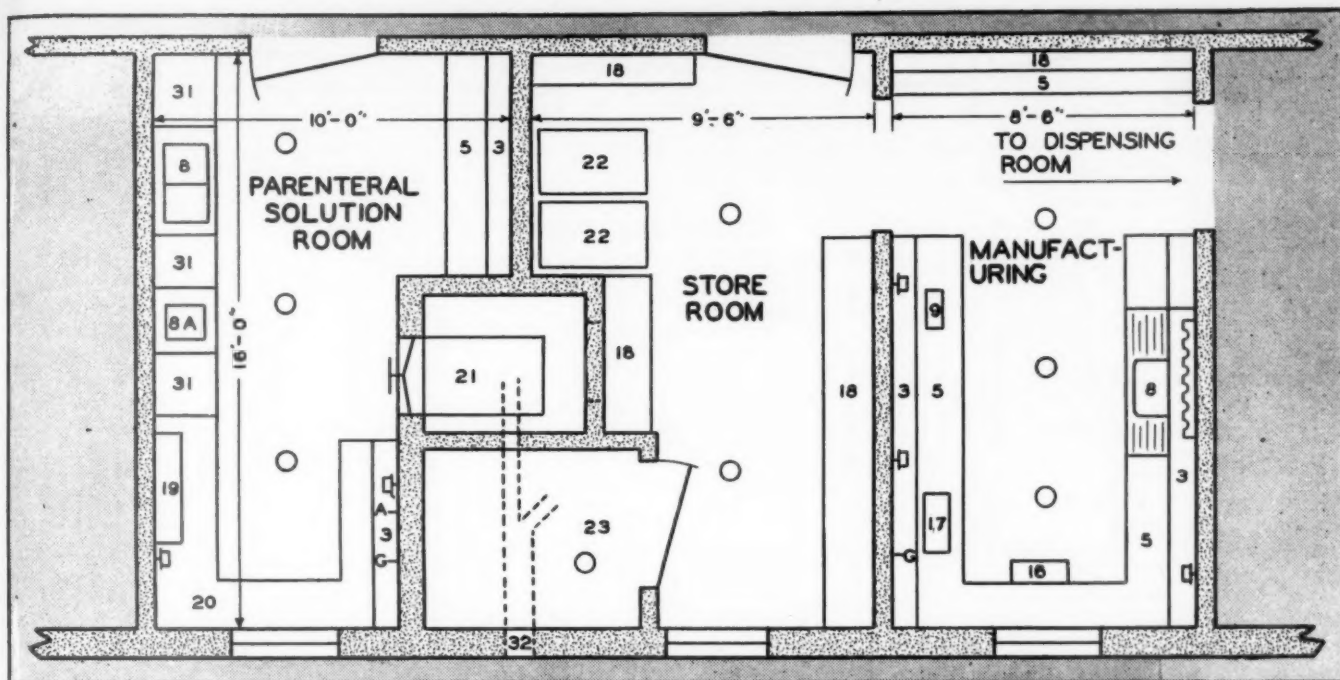
In any case, the most advantageous location for the pharmacy is close to the outpatient department so that outpatients need not wander through the building seeking prescription service. Another controlling factor will be the location of the pharmacy dumbwaiter with respect to nursing stations on upper floors.

Convenience of access to central sterile supply, laboratories and x-ray departments, as well as surgery, are secondary but important controlling factors.

The amount of space required for the pharmacy will vary with the size of the hospital. The U. S. Public Health Service plans, as published in *HOSPITALS*, May 1946, provide 738 square feet for a 200-bed hospital. This is too small for the purpose described and no provisions are made for storage space.

Various authors differ in what they consider adequate space. Floor plans of a pharmacy published in the *Journal of the American Phar-*





## SUGGESTED PLAN FOR A PHARMACY IN A 200-BED GENERAL HOSPITAL

1. Refrigerator—30 cu. ft.
2. Tilting racks for 5 gal. bottles
3. Drug cabinets 18" above counters (adjustable shelves)
4. Prescription files
5. Counters 39" high x 24" wide black linoleum tops; cabinets with adjustable shelves below
- 5a. Built in waste receptacle
6. Narcotic safe
7. Electric dumbwaiter
8. Sink with drainboard and graduate rack,

- cabinet below
- 8a. Sink with bottle rinser
9. Prescription Balance
10. Typewriter
11. Glass enclosed shelves
12. Prescription counter with shelves above and drawers below
13. Schwartz cabinets (back to back)
14. Work table 4'x5½' with shelf above cen-

- ter, cabinets below
15. Window for issuing medications (sliding door)
16. Filter stand
17. Gas plate
18. Shelves
19. Preparation unit for parenteral solutions
20. Water still 10 gal. per hr. capacity
21. Autoclave
22. Barrels

pharmaceutical Association. 7:274-275, June 1946, provides 1,728 square feet for a 250-bed hospital with an outpatient department. A general rule of 600 square feet for a 100-bed hospital and 500 square feet for each additional 100 beds seems to give about the correct amount of space to render the best service.

The pharmacy should be well lighted with fluorescent lights and should be well ventilated. A room with outside windows is preferable. To hasten the delivery of medications to the nursing stations, a pneumatic tube system is recommended, and for larger containers an electric dumb waiter leading from the pharmacy to the upper floors is recommended.

There should be a window through which prescriptions are dispensed to outpatients and nurses. Seats must be provided outside this window for the patients who are waiting. It is a mistake to have a dutch door and attempt to use it as a doorway and a window for dispensing drugs.

If there is a large outpatient service, then two windows may be desirable, one for receiving prescriptions and the other for issuing the medications. In some instances, the second window may be desirable for issuing special medications to the nurse, attendant or physician so that they will not be delayed by dispensary patients.

One room should be provided for compounding prescriptions and filling routine hospital floor supplies. This room should be about 350 square feet in size for a 100-bed hospital and 500 square feet for a 400-bed hospital. In this room there must be a good safe for the storage of narcotics and a walk-in type refrigerator for the storage of biologicals, antibiotics and the like.

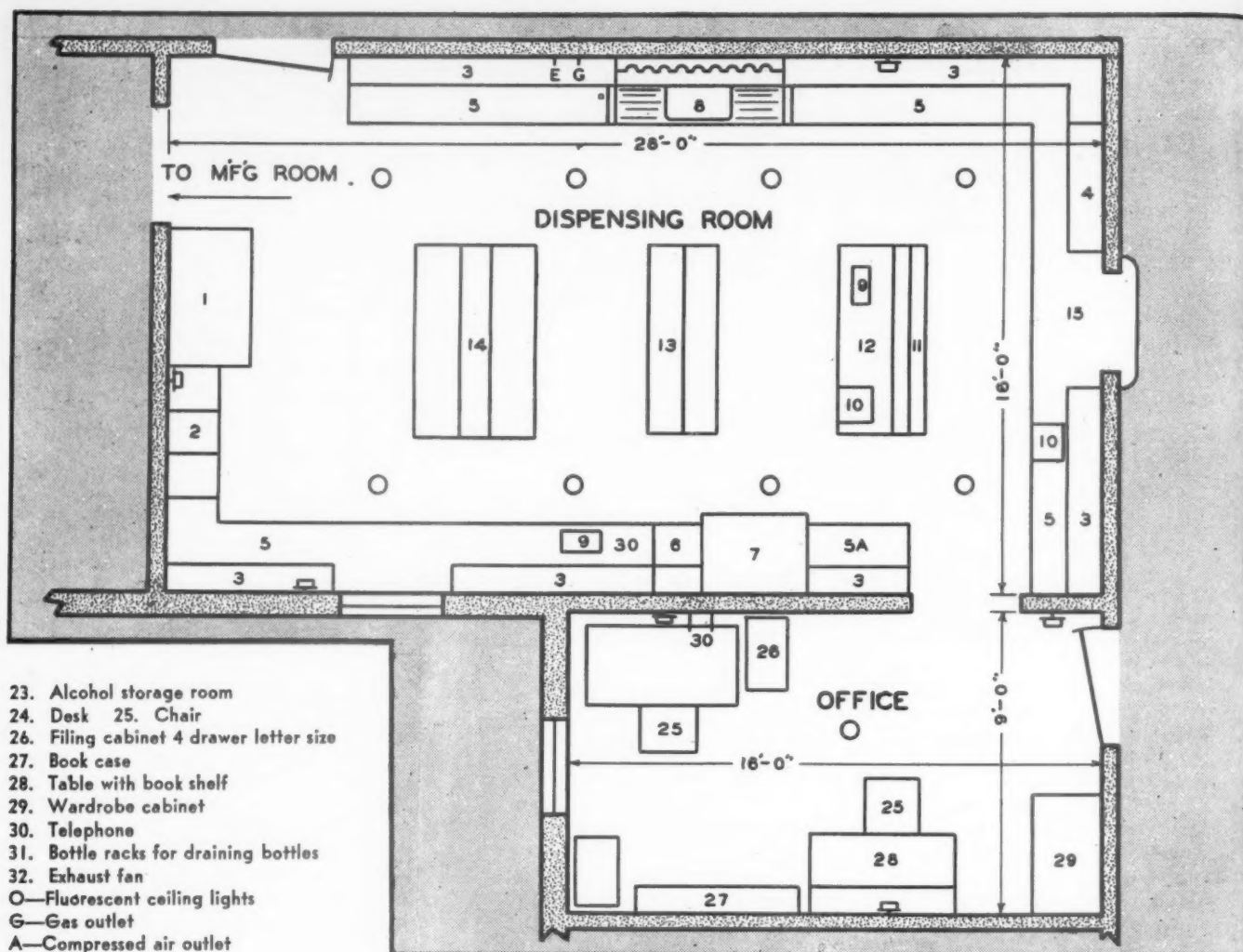
The refrigerator room for a 400-bed hospital should contain about 30 square feet. The federal law requires the storage of alcohol in a separate room. This room should be of fireproof construction and must conform with local fire regulations.

The ideal plan will have the entire pharmacy department on one floor. This arrangement will be found to be a great "step saver" and will be a much more efficient arrangement than if located on two floors. A storage room is too often overlooked in hospital plans. This room should have an ample amount of adjustable steel shelves and barrel racks and, as indicated, should be adjoining the prescription room.

An office for the chief pharmacist is a necessary part of the plans. Here all records, requisitions and invoices are priced, recorded and filed. A good library for ready reference on drugs and chemicals, pharmacology, and therapeutic uses should be at hand with a reading table for the intern or physician.

The amount of manufacturing to be done will vary with the size of the hospital, and the amount of space needed for this purpose likewise will be in proportion to the number of patients. Sufficient space should be allowed, as the hospital





pharmacist can save the hospital hundreds of dollars a year through the manufacture of ointments, elixirs, solutions and the like. Hospitals with a closed staff where treatment and medications are more or less standardized, and hospitals for indigent patients offer the greatest opportunities to manufacture preparations for use in the hospital.

Parenteral solutions can be prepared profitably in the hospital by the pharmacist. In a hospital of 400 beds, the preparation of liter bottles of sterile solutions alone can easily result in the saving of several thousand dollars a year, even allowing for extra labor needed and the cost of the equipment. This would necessitate a separate room adjoining the pharmacy. A room of 300 square feet is sufficient for the average hospital. The sterilizers in the central supply room, which should be nearby, can be used without duplicating this piece of equipment. This room, as well as the manufacturing room, should be provided with floor drains and ample electric

outlets. A large double sink, bottle washer, bottle racks and a hot air sterilizer also are needed.

The equipment should be modern and adequate for the pharmacy to render the best service. Balances, graduates, filter press, electric stirers, ointment mill, mixers and water still are the most essential pharmaceutical items needed. The fixtures should be of light colored woodwork, or enameled white. Schwartz or other similar type cabinets should be used for storage of some of the medications. A floor of asphalt tile is very serviceable.

In submitting a plan for a pharmacy, the needs of a 200-bed hospital were considered since the majority of hospitals are 200 beds or less. Plans necessarily must be altered to conform with the space available in the building. The amount of space will be much greater if there is a large outpatient department.

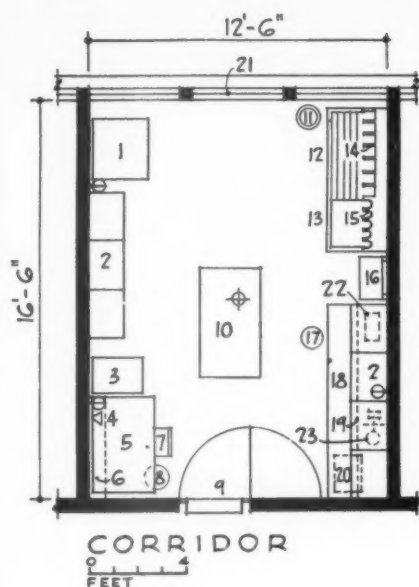
The cabinets above and below the counters in the dispensing room will furnish considerable storage

space. Cabinets of the Schwartz type are desirable for convenience in arranging the stock, to keep it clean and present a more pleasing appearance. As shown in the plan, open shelves would be used on counter 12 and table 14, for frequently used drugs and chemicals. Each cabinet should be numbered and bear an index card of the items within.

Counters should be 39 to 40 inches above the floor. The electric dumbwaiter is an important part of the plan because it will carry orders to and from the floors, saving much time of the nurse or attendant.

The main points for consideration when planning a new hospital pharmacy, are, (1) a central location to minimize traffic and time spent in delivering drugs, (2) adequate space to be able to render the best service and allow for future growth, (3) a compact, orderly arrangement for efficiency, and (4) modern and sufficient equipment to give good service and to promote economy in the cost of medications.

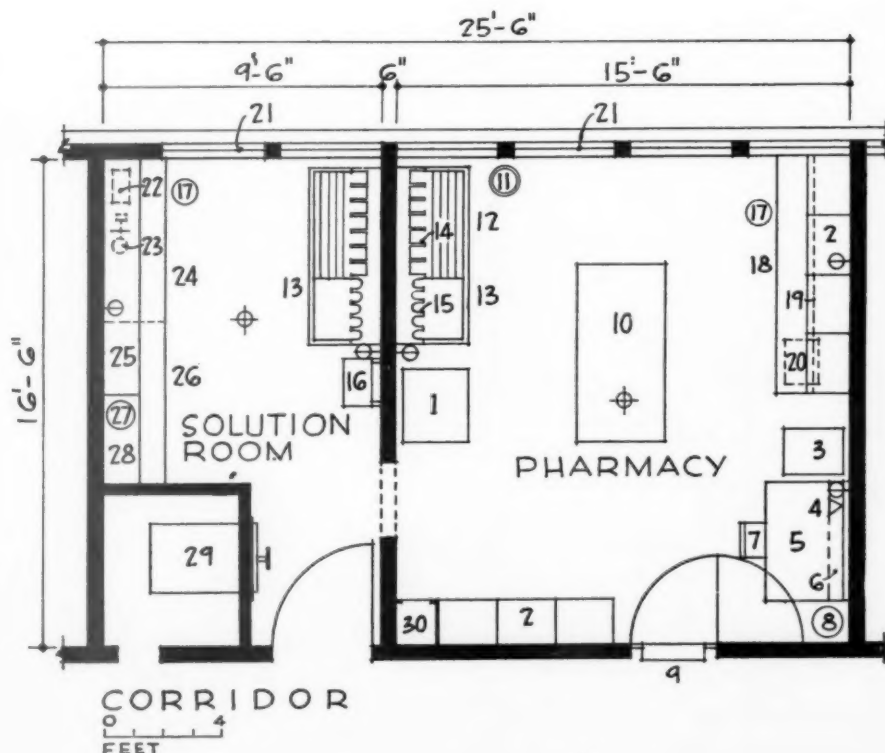
## ADJUNCT DIAGNOSTIC AND TREATMENT FACILITIES



1. Refrigerator, 8 cubic feet
2. Drug cabinet
3. Filing cabinet, letter size, 4 drawers
4. Telephone outlet
5. Desk
6. Bookshelves
7. Straight chair
8. Waste paper receptacle
9. Dutch door
10. Table, 30 x 54 inches
11. Sanitary waste receptacle
12. Cabinet below drainboard

13. Acid proof sink and drainboard
14. Drawing pegs
15. Graduate rack
16. Double element hot plate on bracket
17. Stool
18. Prescription counter with cabinets below
19. Fluorescent light below cabinet
20. Narcotics safe
21. Window guards
22. Prescription balance with weights
23. Counter scale with weights

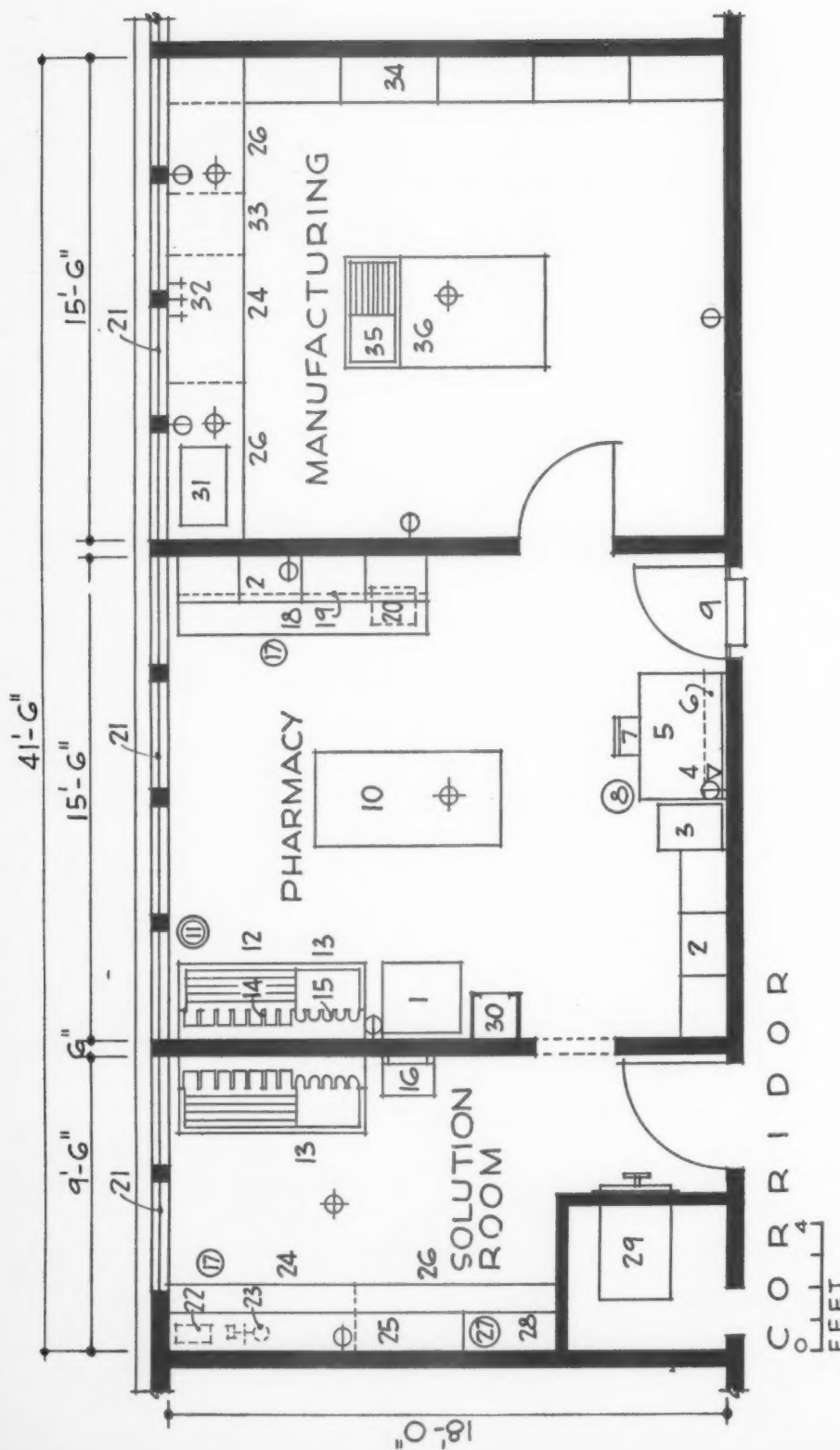
16—Pharmacy for a 50-Bed General Hospital



1. Refrigerator, 8 cubic feet
2. Drug cabinet
3. Filing cabinet, letter size, 4 drawers
4. Telephone outlet
5. Desk
6. Bookshelves
7. Straight chair
8. Waste paper receptacle
9. Dutch door
10. Table, 30 x 54 inches
11. Sanitary waste receptacle
12. Cabinet below drainboard
13. Acid proof sink and drainboard
14. Drawing pegs
15. Graduate rack
16. Double element hot plate on bracket
17. Stool
18. Prescription counter with cabinets below
19. Fluorescent light below cabinet
20. Narcotics safe
21. Window guards
22. Prescription balance with weights
23. Counter scale
24. Counter, 36 inches wide with water resistant top
25. Shelf, 18 inches above counter
26. Cabinets below counter
27. Water still, 5 gal. per hr.
28. Shelf, 36 inches above counter
29. Rectangular sterilizer, 24 x 24 x 36 inches, nickel clad
30. Locker

17—Pharmacy for a 100-Bed General Hospital

# ADJUNCT DIAGNOSTIC AND TREATMENT FACILITIES



18—Pharmacy for a 200-Bed General Hospital

1. Refrigerator, 8 cubic feet
2. Drug cabinet
3. Filling cabinet, letter size, 4 drawers
4. Telephone outlet
5. Desk
6. Bookshelves
7. Straight chair
8. Waste paper receptacle
9. Waste door
10. Table, 30 x 54 inches
11. Sanitary waste receptacle
12. Cabinet below drainboard
13. Acid proof sink and drainboard

14. Drawing pegs
15. Graduate rack
16. Double element hot plate on bracket
17. Stool
18. Prescription counter with cabinets below
19. Fluorescent light below cabinet
20. Narcotics safe
21. Window guards
22. Prescription balance with weights
23. Counter scale
24. Counter, 36 inches wide with water resistant top
25. Shelf, 18 inches above counter

26. Cabinets below counter
27. Water still, 5 gal. per hr.
28. Shelf, 36 inches above counter
29. Rectangular sterilizer, 24 x 24 x 36 inches, nickel clad
30. Locker
31. Opaque glass insert in counter
32. Gas, compressed air and vacuum outlets
33. Drawers below counter
34. Adjustable metal shelves above counter height, cabinets below
35. Sink and drainboard
36. Table with soap stone top



# THE MINIMUM EQUIPMENT *Required for a Useful Hospital Pharmacy*

**T**HE ECONOMIC IMPORTANCE of the pharmacy and the professional service it can render is one department in the hospital that is too often neglected. If the medicinal requirement is an important factor in patient care, it is reasonable to assume therefore that the equipment and trained personnel of the pharmacy should also be in keeping with the rest of the hospital. There has been some progress in many hospital pharmacies, but the isolated advances have not kept pace with the accumulated needs and scientific discoveries.

The economic advantage of manufacturing has apparently not been given serious consideration in the past. It matters little except from the viewpoint of economy, whether the hospital prepares its own parenteral solutions or buys them from commercial sources, but the pharmacy should be equipped to prepare intravenous and other sterile solutions.

No manufacturer can meet the demands for all the types of sterile solutions required in the modern hospital, and this is particularly true where any amount of research work is carried on within the institution. The introduction of penicillin and other anti-biotic substances, and the sulfa drugs have created a demand for pyrogen free physiological solution of sodium chloride and distilled water, and it should be a normal function of the pharmacy to supply this material, at considerable saving to the institution.

That the pharmacy service in many hospitals is inadequate is evident from the numerous resolutions on the subject adopted by the American College of Surgeons, the American Hospital Association and other organizations. The American

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CHIEF PHARMACIST, CHARITY HOSPITAL, NEW ORLEANS

Society of Hospital Pharmacists will propose shortly a program for minimum standards for hospital pharmacies. It is to be hoped that when this program is submitted to the proper accrediting bodies that it will not only be approved but made mandatory for all hospitals and thus assure for all approved institutions complete pharmacy service.

No pharmacy, however, can render complete service without minimum technical equipment. The kind and amount may vary with the size and type of the hospital, but certain basic equipment is essential. Based on actual experience and a thorough knowledge of the requirements in the modern hospital, I would consider the following equipment as essential:

1. A good water still, steam heated, equipped with bafflers; 20 gallon capacity or more per hour, with a tin lined storage tank of 100 gallon capacity. If intravenous solutions are to be prepared, a double or triple still is more desirable. A single still, however, may be used safely, provided it is equipped with bafflers and is kept clean and operated properly, and only freshly distilled water is used. The distilled water should be tested daily for the presence of electrolytes. For this purpose the purity meter (operating on the electrical conductivity principle) is recommended.

2. A good autoclave, with recording thermometer and an Arnold type sterilizer. The demand for sterile solutions, for both parenteral and local use, is an important service that pharmacy alone can render efficiently and economically.

3. General glassware — beakers, bottles, graduates, flasks, pipettes, percolator bottles, percolators, and stirring rods.

4. Filtering apparatus — funnels, filter paper, assorted sizes and types, bacterial filters, Seitz or Berkefeld; suction pumps, pressure filters (if large quantities of solutions are to be filtered) and filtering racks to hold five gallon bottles.

5. Mixing apparatus—glass lined mixing tank, 25 gallon capacity or more; portable electric agitator, sieves, mortars, pestles, spatulas, glass slabs, homogenizer, ointment mill, Hobart mixer, 12 or 20 quart capacity.

6. Balances—analytical, sensitive to 1/10 mg; prescription balance, sensitive to 2 mg.; heavy duty prescription balance, sensitive to 10 mg.; balance for general weighing, capacity 5 kilo or larger.

7. Refrigeration — adequate in size, bearing in mind the increased use of anti-biotics, and capable of maintaining a temperature of 4 degrees centigrade.

8. Sink—a large double compartment, acid resistant sink. The inside dimensions should be at least 30" x 40", and have a depth of at least 18". Automatic rinsing spouts should be mounted between the compartments of the sink.

9. A locked vault or suitable storage place must be maintained for narcotics and alcohol. Federal regulations make this mandatory.



**10. Miscellaneous equipment**—electric hot plates, bunsen burner, electrometers or comparator, water baths, evaporating dishes, suppository molds, ring stands, storage cabinets for prescription bottles and corks, label cabinet, printed labels, typewriter, carboy inclinator, files suitable for literature, invoices and prescriptions.

Also, files for narcotic and alcohol inventory and records, and for all stock carried by the pharmacy, the latter file to serve as a record for purchases and stock on hand through a systematic purchase and manufacturing record of the card index type.

**11. Location and floor space**—The pharmacy must have space and the necessary equipment in order to operate efficiently and economically. The pharmacy dispensary should be convenient to the outpatient department and should be accessible to elevators or other device for service to the various floors. The pharmacy laboratory should be located as close as possible to the dispensary and, if located on a floor above or below, the laboratory and dispensary should be connected by a motor driven dumb-waiter.

The floor space devoted to the pharmacy should be approximately 1000 square feet for a 100 bed hospital; an additional 500 square feet should be allowed for each increase of 100 beds. If surgical supplies are carried additional space should be allowed. It should be borne in mind that manufacturing in a hospital requires space for raw material, empty bottles and finished product.

The prescription department should be equipped with Schwartz-type cabinet fixtures and open steel shelving for storage of raw material. A stock room should be provided for the storage of empty bottles and packaging containers. A separate area — preferably a closed room provided with desk and other office fixtures—should be available for the use of the pharmacist. This area should contain the pharmacy library and reference material and should be available to the medical staff.

**12. Library**—The pharmacy in an efficiently operated hospital serves as a clearing station for information on all subjects of medical

care and in order to render this service efficiently it must have ready reference available in the form of standard text books on many subjects and current literature.

Standard books should include the "United States Pharmacopeia XII" and interim revisions, the "National Formulary VII," "Remington's Practice of Pharmacy," "United States Dispensary," twenty-third edition; "Pharmaceutical Recipe Book," third edition; Dorland's "Medical Dictionary," Gutman's "Modern Drug Encyclopedia and Therapeutic Guide," Goodman and Gilman's "Pharmacological Basis of Therapeutics," Merck's "Index" and "Manual," the "New and Non-official Remedies," reference books on organic, inorganic, and quantitative chemistry, and on physiology, biological stains and clinical pathology.

The current journals should include a complete, indexed and readily available file of current commercial pharmaceutical preparations and their journals, the *Journal of the American Medical*

*Association*, the *Journal of the American Pharmaceutical Association*, practical and scientific editions, the *Bulletin of the American Society of Hospital Pharmacists*, *Drug and Cosmetic Industry Journal*, *Oil, Paint and Drug Reporter*, *American Journal of Pharmacy*, *American Professional Pharmacist*, federal and state regulations governing the use of narcotics and alcohol and a copy of the state's pharmacy laws and sanitary code.

No amount of equipment, however, will assure good service for the hospital unless the pharmacy is staffed with competent pharmacists. Hospital pharmacy is a highly specialized occupation; the mere possession of a certificate to practice is no criterion that the applicant is qualified to assume charge of a hospital pharmacy. Administrators should exercise the same care and vigilance in selecting pharmacists as in the case of other department heads. Competent pharmacists should be encouraged to make hospital pharmacy a career and not just another job.



# *Administration of an*

## EFFECTIVE PHARMACY

### *Requires a Sound Policy*

**H**OSPITAL PHARMACIES, to be run efficiently in the light of modern economics and administration, need clear policies of management and operation. \* Because of the administrative and professional nature of the pharmacy service the policy subdivides into administrative and professional categories. Other papers of this series will discuss under professional policy the advisory pharmacy or therapeutic committee, and the hospital formulary. This review will be confined to the administrative policy.

The policy cannot be put down in a few inflexible words because the conditions to be covered vary with different hospitals. The details cannot and need not be brought out in this short summary. The administrator will wish to understand the policy in its general scope but not necessarily the actual working details, since these will be selected and put into operation by the pharmacy personnel.

The hospital administrator's understanding and backing of the hospital pharmacy in its administrative policy is one of the most important contributing factors to the success of this service. Without this backing the best policy in the world cannot be maintained. The scope of the administrative policy will be discussed under six headings: Personnel regulations, hours of operation, pricing, buying, dispensing and records.

#### PERSONNEL REGULATIONS

Short order may be made of the personnel problems if the hospital has a well defined and functioning personnel department. The director of the pharmacy — with the

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advisory assistance of the director of personnel — will work out a basis of employment and conditions of employment such as vacations, sick leave, hospitalization, group insurance, health examinations and salary schedules with regularized pay increases so that there will be definite patterns for both the professional and lay personnel of the pharmacy department.

Lacking a personnel department, a definite policy for the above problems will still be needed and the administrator of the hospital and the director of the pharmacy will need to come to a satisfactory agreement on each of these factors. The director of the pharmacy will need the initiative to enroll in a college class in personnel management or should find the hours necessary to read books published on the subject in order to learn accepted outlooks in the field of personnel relations.

Job analysis for each position or type of work aids in helping each individual know what is expected of him and also allows for better supervision of the work being performed.

#### HOURS OF OPERATION

Although the hours of operation of the pharmacy will vary necessarily, since conditions differ in various sections of the country, real effort should be made toward an average working day with the pharmacy closed week ends and holidays. Few hospital administrations would feel justified in the added expense necessary to staff the pharmacy so that it could be open 24 hours a day.

When the pharmacy department is closed a method of obtaining emergency medicinals or pharmaceutical information will need to be arranged. One or a combination of the following will take care of this need: An emergency or night kit or cupboard conveniently available to the house staff, and a pharmacist on call. The emergency or night kit is not made up of medications of a purely emergency nature but of necessary medicinals that might be needed occasionally at night and not kept on the floors as routine stock. Such an arrangement relieves the nurses of any responsibility of obtaining medications at night. To function satisfactorily the emergency kit or cupboard should be checked against a list each morning and any item used will have a order left in its place so that it may be replaced and charged if necessary.

A pharmacist on call need not, and preferably should not be in the hospital, but must be available by telephone. It is hard to limit calls to real emergencies if the pharmacist on call is right at hand. The remuneration of the pharmacist on call may be paid in time or money.

#### PRICING

In these days of hospital insurance, flat rates, industrial commissions and welfare cases we hear much of inclusive rates with "ordinary drugs" included. That is a harmless sounding word, "ordinary." I do not know many people who agree on its meaning when applied to drugs, yet if "ordinary

\* Transactions of the American Hospital Association, Report of the Committee on Pharmacy, Vol. 39, 1937, page 154.



Form Ph. 8

DEPARTMENT OF PHARMACY, SAINT LUKE'S HOSPITAL

WORK SHEET

PREPARATION \_\_\_\_\_

SOURCE OF FORMULA \_\_\_\_\_

DATE PREPARED \_\_\_\_\_

QUANTITY \_\_\_\_\_

DATED \_\_\_\_\_

INGREDIENTS	QUALITY	AMOUNT	REMARKS

Calculations and Proof \_\_\_\_\_

Approximate time to complete preparation \_\_\_\_\_

Prepared by \_\_\_\_\_

Checked by \_\_\_\_\_

CHECKED:

\_\_\_\_\_ Calculations

\_\_\_\_\_ Formula

\_\_\_\_\_ Ingredients

\_\_\_\_\_ Weights

DETAILED work sheets lessen the margin of error and provide needed data for the records essential to good operation of the pharmacy.

drugs" are considered as the official agents listed in the "United States Pharmacopoeia" and the "National Formulary," the majority of the medications suggested for recognized treatments will be included.

If the official, expensive, injectible vitamins, hormones and sera are excluded from this free list of "ordinary drugs" a fairly rational list of medications will still be supplied by the hospital on an inclusive basis. There might be a few unofficial medications that are exceptions but these the pharmacy committee will probably agree to include with "ordinary drugs" and sooner or later these too will become official medication.

All other medication ordered by the private physician would be charged to the private patient. Medication which ordinarily would be charged to a patient but which is deemed necessary for a free patient would be furnished if approved by the chief of staff or by whatever method has been chosen for such approval.

The dispensing of medication for the patient to take home should be tempered by the ability of the patient to obtain medication after reaching his home. A plan has been suggested whereby enough medica-

tion would be furnished the patient for his first day or two at home, along with a prescription to be filled at his own pharmacy. Refilling medications after the patient is home is no longer necessary since most patients live within easy reach of the service of a drugstore or pharmacy. The prescription which is sent home with the patient would help the patient feel that he will be able to obtain more of his medicine from his own pharmacy when necessary.

If medications that are to be paid for by the patient are charged at list price or, lacking that, at a regular prescription rate hospitals will have a more uniform pricing system.

A price policy for personnel needs to be decided upon. Prescriptions for the hospital personnel that originate in the personnel health service may be furnished as part of the hospital health plan or be furnished at what is considered cost, which would be the price to the hospital plus a predetermined percent-

age. I believe the latter plan is better for paid personnel because it helps to point out that the hospital pays for everything and as hospital employees we should protect its property.

Personnel such as the house staff, student nurses, student dietitians and intern pharmacists who are furnished maintenance and medical care probably should have the prescriptions that are written for them by the health service filled free of charge.

As a matter of accommodation a staff doctor might occasionally obtain emergency medication for which he would write an order and pay either the list price or the list price less a doctor's discount. Whatever is decided upon must be judged carefully, for any administrator or hospital pharmacist who allows his hospital to become a place from which medicinals may be obtained at wholesale price is putting the institution in a very unfavorable light with regular sources of supply.

#### BUYING

Purchasing of medicinals calls for experience because of the technical nature of the material. Even with a purchasing department in the hospital medicinals need considerable



## NOTE:

To order, check each drug needed, encircling desired strength or size necessary. Liquids and solids are dispensed in 30 cc. or 100 cc. unless otherwise indicated. Upon delivery check drugs received with order, list corrections if any on reverse side of sheet, sign and return to Pharmacy by messenger service.

DATE \_\_\_\_\_

DIVISION \_\_\_\_\_

## THIS FLOOR HAS ITS PROPER NUMBER OF NARCOTICS AND EMERGENCY DRUGS

LIQUIDS	
Acetic Acid (tech.)	240
Acetic Acid Sterile 0.5%	4 L
Alcohol 75 (diag.)	120
Aluminum Hydroxide Gel.	4 L or 500
Aminophyllin Inj. 7.5 gr.	120
Am. Chlor. Syrup	120
Am. Chlor. with Codeine, Syrup	120
Antiseptic Baby Oil (3-4% Mercury only)	1 L
Atom. Spr. Aerosol	30
Bath Solution (St. Luke's)	1 L
Belladonna, Tincture	30
Benzine (tech.)	120
Boric Acid Solution 4% Sterile	120
Boroglycerin, Glycerite	30
Caff. Sod. Benz. Inj. 7.5 gr.	120
Calamine Lotion, Neo or with Phenol	120
Camphor Liniment	120
Camphorated Opium Tincture	30
Castor Oil	120
Chloral Hydrate Solution	120
Cod Liver Oil	120
Colloidal, Flex	30
Dextrose 50% Injection	50
Deodorant, Solution or Spray	120
Digitalis, Injection (1 USP unit)	120
Distilled Water, Sterile	120
Ephedrine Sol. Solution 1% or 2%	30
Ephed. Sol. 1% Spray (Oil)	30
Ephed. Sol. 1% Sterile	30
Fein. HCl 1-1000 Ster. or Non Ster.	30
Fiber Tech. (Ergyl Oxide)	120
Ferrous Sulfate, Syrup (30 GR.)	30
Ferrioxide Solution (Cresol type)	300
Ferrioxide Solution (Inst. & Amp.)	300
Glycerin	300
Glycerin, Sterile	15
Hand Lotion (St. Luke's)	120
Hydrogen Peroxide	120
Hydrochloric Acid Diluted 10%	30
Insulin, Injection	10
Iodine, Mild Tincture 2%	120
Iodine, Strong Solution (Lugol's)	30
Lamp Fuel	120
Liver Extract 2 units per cc	10
Magnesia Magna (Milk Mag.)	1 L
Magnesium Sulf. 50% Sterile	120
Magnesium Citrate Solution	120
Menthol Spray Comp. (Rose drops)	30
Merbromin Sol. N.F. (Mercuric)	30
Mercury Bichloride Sol. 1-1000	4 L or 1 L
Mer. Pot. Iod. 2% Solution	1 L
Methyl Salicylate (Oil Wintergreen)	120
Methylprosalamine Solution N.F.	30
Mild Protein Silver 10% or 20%	30
Oil Sterile	15
Paraldehyde	30
Peppermint, Spts.	30
Petroleum Emulsion	300
Petroleum Liquid (Mineral Oil)	1 L
Petroleum Liquid with Castors	1 L
Phenolalcoholphenalein (USP)	1 L
Plutinary, Post, Sterile 10 units per cc	120
Pot. Cit. Tincture Hyoc. N.S.	30
Prochlor HCl Ster. 1% 1% 2%	30
Silver Nitrate Sol. 1% 5% 10%	120 or 500
Skin Prep. Solution	120 or 500
Sod. Alcoholic (4 W & Surgery only)	1 L
Sod. Baby (Nurses & 4 W only)	1 L
Sod. Concentrate (Nurses, 4C-4 W only)	300
Sod. Dispenser (Nurses, 4C & 4W only)	1 L
Sod. Bromide, Elixir	120
Sod. Chloride 0.9% Sterile	30 cc or 2 L
Sod. Citrate Solution 1% Sterile	4 L
Sod. Hypochlorite Sol. Dil. (Bakia's)	400
Syrup Hydrate Elixir	120
MISCELLANEOUS	
Silver Nitrate Sticks	10
Suppositories, Glycerin (Adult or Child)	12
Sutures, Chrom. Catgut # _____ or Plain # _____	
Sutures, Dermal # _____	
OINTMENTS & LUBRICANTS	
Anesthetized Mercury Ointment 5%	150 or 30
Boric Ointment 10%	30
Ethylaminobenzoate Oint. 5%	30
Iodolins Comp. Oint. (OB & Surgery & 3C only)	60
Lubricating Jelly	tube
Petrolatum Jelly	tube or 150 cc Jar
Sulfathiazole Ointment 5%	30
Zinc Oxide Ointment 20%	30
SOLIDS	
Alk. Eff. Salts	120
Baby Powder (Nurses only)	300
Boric Acid Powder	120
Boric, Phenol & Alum Powder (Douche)	300
Dextrose Powder (diag.)	100
Flour	300
Magnesium Sulfate Crystals	300
Mustard Powder	30
Sod. Bicarbonate	1 Kg - 2.5 Kg
Sod. Chloride (Commercial)	300
Starch (For Colloidal Baths)	2.5 Kg
Sulfanilamide, Sterile	5
Sulfathiazole, Sterile	5
Talc (Bath & Glove Powder)	1 Kg
Theobroma Oil (Cocoa Butter)	60
TABLETS & CAPSULES	
Acetylsalicylic Acid 5 grain	50
Alkaline Arm. (mouth wash tablets)	225
Ammonium Chloride 5 grain	50
Aminophyllin 1.5 grain	50
Ascorbic Acid 50 mg.	25
Atropine Sulfate N.T.	50
Compound Laxative	25
Digitalis Leaf 1/2 gr. (1 USP unit)	25
Ferrus Sulfate 5 grain	50
Glycerol Triacet. N.T. 1/100 - 1/150	25
Meclizone 1 mg.	25
Phenobarbital 1/2, 1/4, 1/8 gr. or 1 gr. N.T.	50
P. A. Caffeine	25
Phenolphthalein, 1 grain	25
Potassium Permanganate 5 grain	25
Scopolamine Hbr. N.T.	25
Sod. Bicarbonate 5 grain	50
Sod. Pentobarbital 1/2 grain	50
Sod. Salicylic 5 grain	25
Sulfadiazine 0.5 gr.	25
Sulfathiazole 0.5 gr.	25
Thiamin Chloride oral 5 mg.	25
NARCOTICS	
Cod. Phosph. 4 gr. oral capsule	25
Cod. Phosphate Solution, Injectable	25
Dilaudid HCl 1/32 grain	25
Morphine Sulfate Solution Injectable	25
P. A. Codeine 5, 10 grain oral	25

POT ADDITIONAL ITEMS ON OTHER SIZE

attention from the pharmacist if good prices are to be obtained without sacrificing the quality of the material or becoming overstocked. There is no magic shortcut to learning how to buy. One needs to be ever on the watch to prevent personal feelings from influencing judgment.

All orders for purchasing medicinals should originate on an order from the pharmacy to the purchasing department, for unless the pharmacy has direct control of its budget the department cannot be held for its expenditures. It is not a function of the administration to decide what will be purchased as pharmacy stock — rather, this is a professional function of the pharmacy committee.

Salesmen and representatives from reputable companies are a

source of information and should find a place in the day of the pharmacist. The pharmacist will help arrange a time for the representative to meet with the house staff as a group from time to time. If there arises any doubt about the suitability of any particular meeting the question would be referred to the pharmacy committee for a professional opinion.

## DISPENSING

Because of the element of danger lurking in every medicinal, dispensing of them by the pharmacy should be done only upon a written requisition or prescription signed by the proper predetermined authority. Such a precaution is necessary for the protection of the dispenser, the hospital and the patient.

ADEQUATE forms mean efficient requisition.

Commonly used medications that are furnished to patients as part of an inclusive rate, and stocked in limited amounts on each nursing division, may be ordered conveniently from the pharmacy by means of a printed requisition listing the stock alphabetically and indicating sizes that will be furnished. Delivery days will be selected that are suitable to both the nursing and pharmacy department. The medications that are kept on the floors are considered as pharmacy stock until used.

These subsidiary pharmacy stocks will need to be checked periodically by a pharmacist with one of the nurses. Such checking not only helps assure that the medication is in good condition but allows the nurse and pharmacist an easy opportunity to discuss proper storage, a new type of medicinal or such other questions that arise from time to time.

Careful selection of floor stock from official drugs and chemicals and standardizing of labeling and bottle sizes is one of the important steps of assuring rational and economical therapeutics in the hospital. By such standardization the routine filling of floor stock requisitions is a very simple, safe and quick procedure.

The floor stock will be prepared in advance when there is time to check containers, labels and the preparations themselves. The printed requisitions simplify the procedures necessary for any accounting or statistical reports.

Dispensing medications by number allows for a large margin of possible error, and so this old practice should be discontinued. The manual writing of prescriptions by house men helps familiarize the young doctors with prescription writing, a subject on which little time has been spent in many medical colleges.

## RECORDS

The records that are kept are of necessity regulated by the requirements of the law and the needs of the hospital for its accounting and statistical reports. Federal and state regulations concerning narcotics

**FLOOR** stocks should be kept complete.

and tax free alcohol require records adequate to show how they were used. A quick checking of narcotics is quite easy if the pharmacy maintains a perpetual inventory.

A card file showing the date of purchase, amount, unit price and name of seller aids the pharmacy department in its buying and pricing. It is simple to ascertain the amount of pharmaceuticals used from such a file and thus overstocking may be avoided. Quantity buying, if it is not overbuying, procures good prices for the hospital.

Records are necessary for all products manufactured by the pharmacy. If work sheets are used to record formula used, method of procedure and data on who prepared and checked the procedures and materials, the sheets may be used to compile manufacturing statistics of the department as well as to serve as control data for the preparations until used.

Prescriptions or requisition counts are simply a matter of recording each day's work in whatever category fits the individual hospital. A yearly physical inventory is needed since a perpetual inventory of pharmaceuticals is hardly worth the time to keep it accurately. If the accounting department does not break down its figures to show pharmacy salaries and purchasing costs these figures, too, should be kept by the pharmacy so that cost per pa-

A black and white photograph of a laboratory storage cabinet with its doors open. The cabinet is filled with various glass bottles and containers. On the top shelf, there are several small bottles and three larger, dark-colored bottles. The middle shelf contains a row of small bottles and a few larger ones. Below this, there is a small locked compartment with a handle. To the right of this compartment, there is a small, dark-colored container. The bottom section of the cabinet has two large doors open, revealing shelves with more bottles. The left door shows a small bottle and two larger ones. The right door shows three large bottles. The cabinet appears to be made of wood or a similar material.

pharmacy director need to know what the pharmaceutical service comprises and what this costs the hospital and patient. This may take the form of a yearly or monthly report. Graphs show at a glance trends from year to year. Reports and records take time to compile and so each one made should have a real administrative value to the hospital.

I hope that in this short summary I have not given the impression that an administrative policy is feasible and necessary for only large, complex hospitals. Everything suggested applies to the smallest hospital, even the one with but one pharmacist. With the administrator and pharmacy director in agreement not too much difficulty should be encountered in maintaining intelligent administrative policies that will aid in increasing the efficiency of the pharmacy service of the hospital.

[illegible]

**HELPFUL** in stock control is this file card showing date, amount, unit price and seller.



# How the PHARMACY COMMITTEE Can Aid

**D**ISCUSSION OF the advisability of having a pharmacy committee involves three primary considerations: (1) a clear definition of this committee, (2) its place in the hospital organization, and (3) its desirability.

The definition must, of course, include an explanation of the purpose for which the committee is created. A full explanation of the place this group occupies in the hospital involves an understanding of its position in relation to: an established chain of authority, limits of authority, the functions deemed desirable for it to perform and the scope of its operation. If these aspects are properly determined we should have no difficulty deciding whether or not such a committee is desirable in our individual organization. The final decision will be a matter of individual preference—perhaps rightly so.

As a basis of formulating an opinion, the following questions should be considered: What is a pharmacy committee? Who serves on the committee? What is the purpose of the committee? How did such groups originate? Who appoints them? To whom are they responsible? How far can their authority be extended? Just what should they do? How do they raise or lower the standard of care given the patient?

Now just what is a pharmacy committee? Stated simply, it is a committee on pharmacy. The dictionary tells us that a committee is a person or group of persons appointed to act on some matter. Translated into terms of the specialized field with which we are concerned, the term "pharmacy committee" would seem to refer to a group of persons appointed to act upon matters concerning pharmacy or pharmaceutical service in the hospital.

The number of members in this group, the subjects upon which it

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acts and the extent to which it should act probably will depend upon factors peculiar to each hospital. Another variable characteristic will be its composition. Who should be appointed and who should be represented? The persons selected may be a group of physicians; physicians plus the chief pharmacist; or the physicians, the pharmacist and the administrator or his representative. Certainly, to function to the best advantage the pharmacist should be a part of the committee.

Whether the administrator should be a member is a debatable subject. If the committee functions as will be outlined in this discussion, it should not be necessary for the executive officer of the institution to be represented. In fact, smoother operation might be effected without his participation. In many instances, of course, this will not be true. Much depends upon the administrator as well as the persons on the professional staff.

There is some latitude allowable in the actual purpose for which the committee is set up. It might be established to review only problems concerning the medicinal agents to be used; to consider all supplies used in the treatment of patients; to compose and govern a formulary; to pass upon certain policies related to the operation of the pharmacy, or to review subjects in all these categories. It might even be expedient to establish a committee to review all matters related to the pharmacy and the pharmaceutical service; but such objectives seem to be too inclusive to be of optimum value. However, more should be attempted than just the publication of a formulary. The purpose of this body should be to render professional advice upon pharmaceutical

problems which affect the staff and the treatment of patients.

Spease<sup>1</sup> has given us a rather concise outline of the purposes of such a committee. He states that the committee should be for the purpose of determining the policy of operation of the pharmacy, adding to and deleting from the drugs to be used, and in addition should supervise the purchase and dispensation of medicinals and professional supplies within the hospital. These criteria are generally applicable with some modification. The committee should supervise only in the sense of giving professional advice concerning problems which arise out of the purchase and issuance of pharmacy stocks. Most pharmacy committees now in existence operate in accordance with this modification.

Spease's outline appears to have followed closely the establishment of pharmacy committees as they function to-day. The reader can well question the use here of the term "establishment" since these committees probably owe their existence and present structure to a process of evolution. Although there seems to be no readily available information to support this theory such an assumption appears to be logical. References to pharmacy committees prior to 1932 are not only sparse but inadequate for use as a basis of tabulating their method of operation.

Clarke<sup>2</sup> for instance, speaks of a formulary being in use in New York Hospital as early as 1815 and of this publication being provided with a set of governing rules in 1932 by Hatcher and Stainsby, the latter being "chairman of the already established Formulary Committee of the New York Hospital. . . ." It is a

readily accepted fact that one of the tools of a pharmacy committee is a hospital formulary. It is also known that Hatcher and Stainsby did much work in relation to pharmacy committees; but it is not clear if the group referred to by Clarke actually performed duties other than publication of the formulary. Hence, it is not clear if it functioned as a pharmacy committee in the accepted sense of the term.

The oldest pharmacy committee with which I am familiar is the one of University Hospitals of Cleveland. This group held its first meeting April 22, 1932. Since that date we find more frequent references to operation of these committees. In fact, during the last two decades sufficient numbers of such committees have appeared throughout the United States that the American Hospital Association saw fit to establish a committee on pharmacy, which committee made quite a lengthy report<sup>3</sup> in 1937. This report as it appears in the *Transactions of The American Hospital Association* for 1937, includes certain criteria for the establishment and operation of pharmacy committees within the hospital organization.

No definite rule can be written for the mechanics of appointing members to serve on the committee. Depending upon the size of the institution, the appointing authority may be the administrator, the chairman of the staff, the executive committee or some other governing body. However, the governing body of the hospital should stipulate who is to make the appointments, from what groups members are to be selected, the number of persons to be appointed, and to whom the committee is to be responsible. Regardless of where responsibility for appointments is placed the governing body of the hospital must have an opportunity to approve any recommendation which the pharmacy committee chooses to make. To maintain some voice in and control over actions of the staff the administrator must, obviously, be a part of that governing body.

Let us examine, briefly, illustrations of placement and control of responsibility as practiced in certain institutions. The Pharmacy Committee of University Hospitals of Cleveland, to which reference was made previously, is appointed

## Hospital Pharmacy

by the medical council. The committee consists of four physicians selected from the staff of the hospital; the directing pharmacist, who is also dean of the School of Pharmacy of Western Reserve University, and the chief pharmacist of the hospital.

All recommendations proposed by this group must be sent to the medical council for disposition. At Cleveland City Hospital, where there has been a pharmacy committee since early in 1938, the executive committee of the hospital, of which the commissioner-superintendent is a member, appoints the membership of all standing committees, including the pharmacy committee, and requires that all recommendations be referred back to it for disposition. Five physicians, representing the major services or departments of the staff, the assistant superintendent (medical) and the chief pharmacist constitute the pharmacy committee in this institution.

Because of the activities of the committee—and it is usually the busiest of all staff committees, if it functions properly—membership should not consist of doctors who are chief department heads unless they have a particular aptitude or desire to so serve. Ordinarily, these men are much too busy to be further burdened. A much more active group, a group which will investigate the problems more thoroughly and deliberately, will usually result if appointments are made from junior members of the staff who are often more active.

The committee must be composed of persons who are alert, progressive, investigative, deliberate, capable of recognizing the individuality of problems in each type of service and capable of reaching rational decisions. They should be willing and able to study every request and test possible results before making their official recommendations. In addition, to be continuously effective, these members must be of the type who will retain their

zeal and interest. They should also receive encouragement from the administration, which is vital in sustaining the interest of any such group.

All possible efforts should be employed to prevent stagnation of this committee once it has been established. Continuously effective operation of a pharmacy committee is predicated upon the functioning of a good staff organization within the hospital.

Just what are the functions of the committee which we are discussing, and what lies within its province? Here, again, we cannot be specific and set up inflexible limits because peculiarities of each institution dictate policies to be observed therein. By the use of illustrations and general statements, however, a usable outline can be suggested.

As an overall picture we might visualize a pharmacy committee as being a group whose function is to review problems—and make recommendations for their solution—concerning the policy, operation, stock and personnel of the pharmacy, in addition to administrative matters involving other departments. Actually, however, a committee will seldom be found operating on such an all-inclusive basis, although some do approach it very closely.

Such a committee should be empowered to review and make recommendations on anything that has to do with the professional relations of the department. This, of course, would include type and quality of drugs and supplies dispensed; policy governing the issuance of these items; dissemination of information to the staff; means of promoting better cooperation between the pharmacy and staff and, in addition, subjects in which are involved public and patient relations of the pharmacy.

Problems of an administrative nature such as the quantity of drugs and supplies to be carried on inventory, charges for medication to patients, employing of personnel, salaries and the like, unless unusual action is needed, should remain administrative problems. These should require no professional recommendations.

The functions and scope of the pharmacy committee should be stated definitely and clearly in a set of regulations, by-laws or con-



stitution at the time of its inception. In this way transgression will be avoided and harmonious affiliation with other groups in the hospital will not be disturbed. To illustrate, let me quote from the statement of organization at Cleveland City Hospital. This plan of organization was written at the time the pharmacy committee was established and was concurred in by the director of public health and welfare and the superintendent:

#### *I. Executive Committee*

The Executive Committee of the staff shall determine the general policies affecting the professional affairs of the hospital. . . . It shall have the power to appoint standing committees upon various aspects of the professional work and shall define the duties of these committees. It shall appoint standing committees on outpatient department; on pharmacy; on professional procedures. . . . These committees shall meet at stated intervals, to be determined by their members, and shall report their recommendations to the Executive Committee for consideration and disposition. . . . The Executive Committee shall report back to the Standing Committee of the staff, or to the staff, its action upon any matters referred to it.

#### *II. Standing Committees*

G. Committee on Pharmacy—1. This committee shall consider all matters pertaining to the use of pharmaceuticals and other items dispensed through the pharmacy. It shall have the power to make recommendations concerning the pharmaceuticals and formulae regularly used in the hospital. Three members shall constitute a quorum.

Perhaps citation of a few specific subjects reviewed by existing pharmacy committees will serve to explain their functions better than any combination of words that could be written here. The following list is extracted from the minutes of meetings of the pharmacy committees at Cleveland City Hospital and University Hospitals of Cleveland. Rather than attempt to identify the subject with the group which held the discussion, a composite list is presented:

1. Substitution of less expensive drugs for expensive ones where therapeutic actions are equivalent.
2. Advisability of dispensing home-going medications on prescription only.
3. Sale of drugs to personnel.
4. Policy of acceptance of drugs for stock and inclusion in the hospital formulary.
5. Packaging of sterile solutions.
6. Accumulation and disposition of dead stock.

7. Standardization of germicides used.

8. Oral and intravenous gallbladder dyes.

9. Writing of prescriptions by nurses.

10. Suitable adhesive remover.

11. Publication of a hospital formulary.

12. Establishment and maintenance of antidote cupboard in the emergency suite.

13. Disposition of illegibly written prescriptions.

14. List of abbreviations for use in the hospital.

15. Institution of the metric system of weights and measure.

16. Establishment of pharmacy internship.

17. Oxygen therapy.

18. Enteric coatings for tablets.

19. Changes in formulae of items made in the pharmacy.

20. Quantity of medication allowable on prescriptions in the outpatient department.

21. Standardization of sizes of hypodermic needles used.

22. Control procedures to be used in the issuance of penicillin ampoules.

23. Dispensing drugs from the accident ward.

24. Many discussions of specific items to be added to or deleted from pharmacy stock.

Having discussed the origin, organization, functions and limits of authority of the pharmacy committee we arrive at the point of determining its advantages and disadvantages. Some conclusions can then be drawn as to the desirability of its being a part of any hospital organization. The advantages include:

1. We have here a group of active doctors who because of their personal desire to progress will be interested in promoting and maintaining therapy on the highest level.

2. This group, being a part of the staff and enjoying at least a partial alliance with the administration, can do much to smooth operations between the two factions and thus establish closer relationships.

3. For the same reason as above a greater degree of professionalism in the pharmacy will be promoted, and the pharmacist will be kept alert.

4. Because it represents a link between the staff, administration and pharmacy the committee can be used to bridge the gaps and interpret to the staff difficult programs which the administrator or the pharmacist might wish carried forward. This service is particularly valuable in effecting controlled use of scarce items.

An excellent example of the usefulness of such a procedure was evident when penicillin was introduced. Inasmuch as hospitals were allocated certain quantities of the drug it was necessary to institute some method of controlled distribution to the various departments of the staff. When the pharmacy committee was given the responsibility of recommending the procedure to be followed, cooperation of the staff was obtained and the drug was made available to those for whom its clinical use was justified. This was not true in many instances where other means of control were used.

5. Refusals of requests for unmerited drugs will be more readily accepted from a group of the nature of this committee than they would be from the administrator or any other one person. However, the committee should never be used as an escape from responsibility. Such acts will soon be discovered and will result in deterioration of relations between the parties concerned.

6. Economy is effected through the committee. By establishing definite policies of standardization of medicinal agents, the total cost of therapy can be reduced without endangering the level of effectiveness. Economical losses through accumulation of a dead stock of drugs is a problem in many hospitals. These losses can be reduced to a minimum through proper cooperation between the pharmacy, the committee and the staff.

7. More important than the economical benefits derived is the effect the committee should have in promoting rational therapy. By establishing sound policies and procedures governing use of drugs and inclusion of various agents in the armamentarium of the hospital, remedies of unproved therapeutic value can be eliminated.

Unless my perspective is decid-



# *The Well Organized Formulary Serves the* **CONVENIENCE OF ALL**

A HOSPITAL FORMULARY may be a most important adjunct to the efficient and economical operation of a hospital. This is often not appreciated until one considers what a formulary means to the doctor, nurse, pharmacist, patient and administrator.

The doctor is saved much time and many inconveniences by being able to refer to a pocket sized formulary. The young internist especially finds the formulary a valuable guide of reliable information, while the visiting clinician refers to it often since it is a medium through which the various departments may indicate the professional services which are available.

This book should give information regarding x-ray examinations, drugs for diagnostic purposes, laboratory and clinical procedures and other helpful reference material as well as a therapeutic index with a list of reliable drugs and formulae. Such information will help give more patients attention and treatment with minimum delay.

To the nurse the formulary means a source of knowledge which will help orient her in the customs of the hospital. It is also a reliable reference in which she can check on new drug dosages and procedures.

The pharmacy probably will derive more benefit from the formulary than any other department of the hospital. This will be especially true if there are large clinics operated in conjunction with the hospital. The pharmacy will not have to stock several items of the same pharmacological value, since the formulary usually suggests the use of drugs and preparations listed in the U.S.P., N.F. and N.N.R. or special formulae developed by the hospital staff.\*

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With the necessity of having several brands or trade marked preparations of the same drug eliminated, the pharmacist is able to purchase certain drugs in larger quantities at more favorable prices and there is an increased possibility of the pharmacy manufacturing a number of U.S.P., N.F. and special formulae at a considerable saving, often as much as 50 per cent or more. This is a very favorable factor tending to reduce the total pharmacy inventory and expense without sacrificing any of the professional service.

Another advantage is that the formulary will enable the pharmacist to anticipate the prescribing of certain preparations by the physicians. This gives the pharmacy a chance to have some preparations compounded and often packaged in convenient quantities for dispensing soon after the receipt of an order. Thus the pharmacist can render more and better service at less expense.

The patient is indirectly benefited by a hospital formulary through its effect on the efficiency, professional service and economy of the departments serving him. He should receive attention and treatment sooner than might otherwise be possible and he will also be able to have his prescriptions filled with reliable and fresh drugs, which can be compounded and dispensed with minimum delay and at the most favorable price. These factors, especially the professional

service and the time and the expense involved, usually worry the patient and these are the factors which a hospital formulary may influence the most.

The value of the formulary to the administrator is its combined value to the above groups and this usually means a more efficient and economically operated hospital with the best professional service. The administrator or any one preparing a hospital formulary must be warned that there is a grave danger of just the opposite effect being obtained if caution is not observed in setting up a formulary and the policy regarding it. This danger comes from the very element of the formulary which may contribute most to an increase in efficiency and economy—the element of standardization.

The danger is not from rational standardization but from too stringent a standardization of procedures and formulae and the degree of this standardization is dependent upon the institution and situation involved. Some institutions may inadvertently sacrifice professional service and efficiency for the sake of the greater economy which may be effected by a standardization in which the physician is restricted to an inadequate choice of drugs, formulae or procedures.

This may be exemplified by any situation in which the hospital staff is restricted to the use of only one member of each of the various classes of medication, such as one antiseptic, one general anesthetic or one local anesthetic. This is an extreme and absurd example; how-

\*U.S.P. (The United States Pharmacopoeia), N.F. (The National Formulary) N.N.R. (New and Nonofficial Remedies).

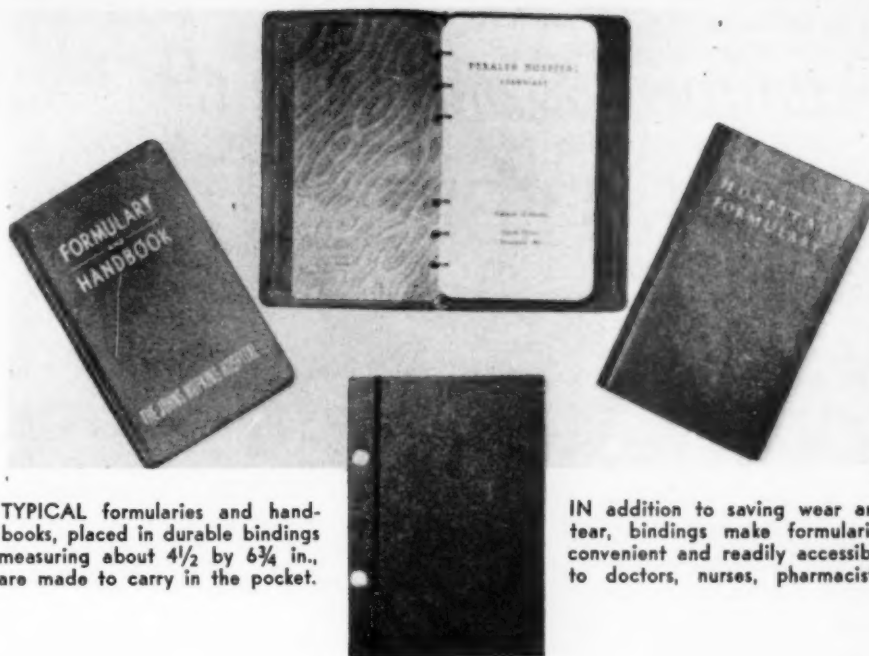
ever, it serves to point out a situation which may prevail to a lesser degree if caution is not observed in setting up a hospital formulary. Too much emphasis cannot be placed on the fact that the hospital staff must have available any useful procedure, drug or formulae.

The task of compiling a formulary is usually the responsibility of the hospital pharmacy committee and any specialists who may be available. All sections of the formulary, however, should be reviewed by staff members interested in their contents and any comments or suggestions made by them must be given serious consideration. This will assure cooperation of the hospital staff in the ultimate use and establishment of the formulary in the hospital.

Generally, only U.S.P., N.F. and N.N.R. drugs or formulae should be admitted to the formulary, an exception being made in cases of drugs or preparations of outstanding value or those which have been found to be exceedingly useful in the institution compiling the formulary. Essentially, the formulary must be tailored to the hospital and the staff of doctors, nurses and pharmacists who are to use it. Several representative pages of various hospital formularies are reproduced herewith to serve as an example for anyone compiling a formulary.

In compiling a formulary, the following topics may be considered and information given regarding them:

1. Prescription writing with a complete list of Latin abbreviations.
2. Size of prescriptions and orders which are most readily available.
3. Vehicles and colors.
4. Drugs subject to federal and state regulations.
5. Buffered and isotonic solutions.
6. Table of pH indicators.
7. Tables of trademarked preparations with their public names.
8. Antiseptics.
9. Drugs for diagnostic purposes.
10. Endocrine preparations.
11. The vitamins.
12. Available drug list.
13. Vaccines, serums and antitoxins.
14. Therapeutic index.
15. Hospital formulae.
16. Parenteral fluids with some of their uses.
17. Pediatric therapeutic index and procedures.
18. Well-baby clinic data.
19. Dental drug list.



TYPICAL formularies and handbooks, placed in durable bindings measuring about 4½ by 6¾ in., are made to carry in the pocket.

IN addition to saving wear and tear, bindings make formularies convenient and readily accessible to doctors, nurses, pharmacists.

20. Institution's dental drug formulae.
21. Charts indicating types of diets and their uses.
22. Average heights and weights.
23. Obstetrical data.
24. X-ray examination and consultations.
25. Laboratory and clinical procedures.
26. Common emergencies.
27. Treatment of burns.
28. Treatment of acute poisoning with a complete list of recognized antidotes.
29. Table of international atomic weights.
30. Sulfonamides and antibiotics.
31. Maximum safe doses of potent and dangerous drugs with emphasis on the irregularity of response and idiosyncrasy of the patient.
32. Sedatives and hypnotics.
33. Policy and purpose of the publication.
34. Index with adequate cross references.
35. A list of instruments and equipment with their location.

Revisions of a formulary are very important and must be provided for as often as necessary. This should be at least as often as the revisions of the U.S.P. and N.F. If revisions are not made, the book soon loses its value and is worse than no formulary.

With the present rapid progress

in medicine and pharmacy, it is advisable to revise a formulary as often as every two or three years. Even with such short periods between revisions it is well to supplement the formulary with special bulletins which give complete information regarding new drugs, treatments or special procedures. This not only serves to keep the personnel well informed, but draws the attention of new staff members to the formulary and the services available in the hospital.

Those interested in further discussions and information regarding hospital formularies are referred to the report of the committee on pharmacy in the *Transactions of the American Hospital Association*, Vol. XXXIX—1937, and the papers on "The Formulary System" in the pharmacy section of the *Transactions*, Vol. XLII—1940.

#### SUMMARY

The hospital formulary is discussed and its uses other than as a pharmaceutical guide pointed out. Various topics considered are:

1. Value of the formulary to the doctor, nurse, pharmacist, patient and administrator.
2. Standardization of drugs, formulae and procedures and the danger involved.
3. Possible contents of a formulary.
4. The necessity of frequent revisions of a formulary.

*Hospital Pharmacy*

# Attaining Economy in the Pharmacy Through NON-STERILE MANUFACTURE

**M**OST HOSPITALS, regardless of size, can effect considerable dollar savings by manufacturing in the pharmacy department. The term manufacturing includes both sterile and non-sterile products, but the discussion here will be regarding preparations of a non-sterile nature, since another article in his series will cover sterile solutions. This paper is concerned chiefly with the manufacture in bulk quantities of standard formulas for inpatient and outpatient consumption on an "ahead of time" basis.

A list of products that can be manufactured includes everything from simple solutions to tablets of every size and description, and could include capsules, tinctures, elixirs, mixtures, massage alcohol, lotions, suppositories, syrups and ointments. All preparations used in the hospital which are official in the United States Pharmacopoeia and the National Formulary as well as special formulas of a like nature which have found a place in the hospital medicinal formulary should be included.

The list may include many formulas for special investigational use and such items as complex vitamin preparations. Aside from medicinal substances, the department may prepare such items as deodorants, duplicating fluid, floor waxes, metal polish and other products normally required by a hospital.

There are definite advantages to manufacturing in the pharmacy, but the chief one is dollar savings. For the products the pharmacist is able to make, it can be shown that many costs can at least be cut in half, others more or less. We believe that the minimum saving that can be effected is not less than \$2,000 annually for each 100 beds. Thus,

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a 500 bed institution can save approximately \$10,000 a year. These figures will fluctuate somewhat according to the presence or absence of a dispensary clinic since consumption of drugs by clinics is considerable.

We consider it good judgment to make many products in the interest of consistency, since there are frequently variations in products obtainable commercially unless all are purchased directly from one manufacturer. Lack of consistency requires time-consuming explanations to nurses, doctors and patients, often with uncertain and dubious results.

Manufacturing is also an advantage because of lack of immediate availability of finished products in local markets, even though a marked monetary savings may not be effected. Raw materials are nearly always available on the pharmacy shelves for ordinary prescription compounding and an increase of bulk material and the number of items will permit their use for manufacturing.

Quality will be equal with that of products obtainable commercially. Pharmacists are well trained in the art of compounding all pharmaceuticals having an official status as previously mentioned. A great percentage of the medicinal substances required for hospital use fall within this category, or are simply prescription formulas adopted

by committees responsible for the hospital medicinal formulary. None of these involves a professional art beyond the reach of the experienced hospital pharmacist and the quality should be beyond reproach.

The equipment required to proceed with the plan outlined here need not involve too much of an investment. For a hospital of 150 to 200 beds, existing technical equipment used for prescription compounding, plus a small suppository machine, portable mixer and glass lined storage tanks for soap, germicides, medicated alcohol, and similar items may suffice. The investment will not be over a few hundred dollars. In some smaller hospitals much can be done with little more than ordinary prescription necessities.

In larger institutions of 500 bed capacity, it can be shown to be good economy to manufacture compressed tablets. A single punch tablet machine along with equipment for powder mixing and granulating—all or part of which may be essential—require a total investment of about \$1,000. Likewise an ointment mill, a batch mixer of 20 gallons or more capacity and filtering equipment, may well find a place in these institutions with possibly a few hundred dollars more invested.

These figures may sound like considerable money to some readers, but in a year or so (and more often less than a year) the money will be returned with interest. And "interest" will come in a different way also—in inspiration and accomplishment. Following is a list of suggested equipment, all or part of which may be needed to adapt the plan to your hospital:





Water	Viscolizer
Batch mixer	Filter transfer
Storage tanks	pump
(glass lined)	Suppository ma-
Portable mixer	chine
Ointment mill	(cold)
Tablet compressing	Suppository molds
machine	Hot plate
Powder mixer	Water bath
Wet and/or dry	Tube filling
granulator	machine

This list does not include ordinary small technical equipment required for prescription compounding, since all hospitals operating a pharmacy already have these. Others are already doing manufacturing on a limited but outmoded scale, but may have part of the items listed, such as a water still. Very large hospitals may find this list inadequate and some of the equipment may be obsolete for very expanded programs. The group mentioned here, however, should fill most of the needs for the average institution up to 1500 beds.

In establishing an efficient and progressive manufacturing laboratory, regardless of size, it is advisable to make available a number of text books covering the subject needs, as well as current magazines to keep the pharmacist posted on markets and special formulas. The dollar investment is not large. It is well for the manufacturing pharmacist to develop a formulary of his own with complete details as to procedures on bulk formulas.

The following list of suggested books and periodicals, (although many others are available and may seem more adaptable) will serve as a guide for the uninitiated: *Professional Pharmacist*, *Drug & Cosmetic Industry*, *Journal American Pharmaceutical Association* (practical edition), *Drug and Cosmetic Industry Journal*, "Art of Compounding" (Scoville), "Tablet Manufacture" (Stokes Machinery Co.), American Pharmaceutical Association recipe book.

In expanding pharmacy facilities to permit the execution of any manufacturing project, it will be necessary to consider floor and shelf area requirements. The trend of hospital architects in the past few years has been to allocate approximately five square feet of floor area per bed to the pharmacy department. Approximately 25 per cent of this area should be allotted to manufacturing and 50 per cent to stor-



MANY TYPES of tablets used in quantities can be manufactured at considerable savings.

age. Arrangement and subsequent division of the space will depend on the extent of manufacturing and the efficiency of the storage area. Here much consideration should be given to shelving. At least two square feet of shelf space is necessary to properly locate all raw materials and finished products in the manufacturing unit.

In considering the requirements in relation to their particular problem, many administrators will find that many of the requirements already have been met, or can be met with a little rearrangement of existing equipment.

In order to manufacture on any scale, it is, of course, essential that the hospital employ a competent pharmacist, unless such a person is already available full time. Often with proper organization of procedures, the existing personnel has less active periods which may be devoted for all the manufacturing that it is practical and profitable to do. In hospitals normally employing more than one pharmacist, part time of one or both may be allocated to the project. In hospitals of 500 beds or more it can be shown that it is profitable to employ a pharmacist—and possibly one or more assistants—specifically for the manufacturing unit.

Before entering into any manufacturing in the hospital pharmacy, it might be wise to prove the soundness of the venture. It is important to remember the points previously discussed in this article regarding

quality of self made products, convenience of extemporaneous preparation and consistency in products, but all of these are of secondary importance until it can be shown that actual dollar savings are effected.

A survey of the problem might be made reviewing all purchase of tablets, ointments, suppositories and pharmaceutical preparations for the last two years. Determine the cost of purchasing these on a contract basis for a year; consider their costs and the total cost of manufacturing these products yourself. In finally determining the savings you can effect, consider chiefly the out-of-pocket costs for any investment necessary to carry out the program. This cost may entail some extra expense. On the other hand you may require only existing labor, space, power and equipment and it may not be fair to include these in computing the actual cost of manufacturing.

For establishing a complete manufacturing laboratory all these items must, of course, be included, along with general hospital administrative costs and amortization of any equipment installed for the purpose.

In determining savings, a breakdown for each type of product is also advisable. For example, the problem of tablet manufacture involves a recapitulation of all the tablets which it is practical to manufacture, with particular consideration given to the savings possible, maintenance and amortization of tablet machinery required. Likewise, in making bulk quantities of ointments, it may not be proper or wise to invest in machinery unless the total requirements will produce ample savings to pay for it.

#### SUMMARY

In summarizing, it may be pointed out that manufacturing of non-sterile products in the hospital pharmacy has definite advantages—chiefly, dollar savings. Other important advantages are quality, consistency and greater availability, as well as improvement in service and reduced cost to the patient. It has been shown that the plan involves a relatively modest financial investment and may provide for more productive use of available pharmacy personnel.



THE MANUFACTURE of sterile medications within a hospital's own pharmacy assures economy, aids more efficient treatment of patients. Ohio State University photo

## Organizing the Pharmacy for Preparation of STERILE MEDICATIONS

IN HOSPITALS, sterile medications comprise a very vital portion of the total drugs administered to patients. Many of these may be classed as emergency, dramatically influencing the patient's recovery. This being true, it is important that an institution have a readily available source of sterile medication. It has been verified, further, that the manufacture of these medications within the hospital results in better service and economy to the patient.

Sterile medication may be defined simply as a class of medications prepared by an approved technique which assures a sterile, non-pyrogenic product and which renders the preparation safe for parenteral administration. That the importance and popularity of this class of medication are ever increasing is confirmed by inclusion in the official compendium, the USP XII, of 25 additional monographs for injectible medication.

The logical question that follows is: Who in the hospital should assume the responsibility for this

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manufacture? In view of the fact that these sterile medications are a class of drugs, the responsibility would necessarily be delegated to the pharmacist.

The fact that heat affects solutions of chemicals in various ways, depending on the size of the container and the nature of the solute involved, is again a reason to employ the integrity and specialized skill of the pharmacist who has been educated and trained to recognize these limitations. A simple but meticulous routine for preparation is established which serves not only as an assembly line for turning out this necessary medication but also as a valuable teaching adjunct for removing the mystery long associated with the procedure.

Equipment necessary to carry on such a program includes an autoclave, a water still, a balance, fil-

ters, and bottles for the solutions. The most ideal arrangement would be to equip a laboratory adjacent to the pharmacy; however, in the smaller hospitals a common sterilizer and water still for the pharmacy, surgery and central supply room should suffice. The expenditure involved in such an arrangement would be small, but even if a laboratory were set up it would pay for itself in less than a year.

The still should be of construction that will enable it to produce a distillate fulfilling official requirements. There are several popular models which produce a single distilled water meeting these requirements, thus eliminating the cumbersome and expensive triple still. It is of paramount importance that the operator understand the maintenance of this particular piece of equipment, as it is necessary to clean it regularly to produce a distillate of constant purity. The USP XII outlines a test for the determination of pyrogenic material in solutions. This test might be run routinely or at intervals for



checking the solutions for foreign reaction material.

It cannot be over-emphasized that a very thorough cleaning process at regular intervals must be maintained. Only freshly distilled water can be used and solutions must be sterilized as soon as they are made. This eliminates bacterial growth which might act in vivo as reaction material. Full directions and illustrations as to the operation and maintenance are furnished with stills. The procedure is simple and logical.

Flasks and vials for the solutions can be purchased from several sources. In many cases the empty containers from commercial solutions in the hospital are adaptable to reuse. This latter is a most economical approach and if handled correctly will serve as efficiently as any other. The number of the flasks and vials needed depends on the schedule of the pharmacy personnel. The solution, if hermetically sealed, will keep indefinitely. Any amount may be put up in advance.

A three day supply on the faster moving solutions is ideal while on the less popular items a week's supply or more is not difficult to maintain. A label bearing the name of the solution, a control number and date of manufacture is attached to each flask. It is well also to include a two months' (or some other arbitrary time) expiration date to help insure the use of the oldest solutions first. It is also suggested that the pharmacist inspect all solutions for foreign material, even after they are sterilized.

Pyrex flasks are considered better for sterilizing solutions; however, glass of good grade, much cheaper than pyrex, can be obtained which complies with USP qualifications for glass containers for injections. Since breakage does occur, this is a factor to consider. It is estimated that in a 500-bed hospital an average of 15 flasks a month will be broken. This figure is based on a wartime personnel and may vary with the more cooperative staff of normal times. It might be well to keep an eye on new developments in parenteral solution containers. The wealth of glass information to come out of recent advances heretofore not available to civilian in-

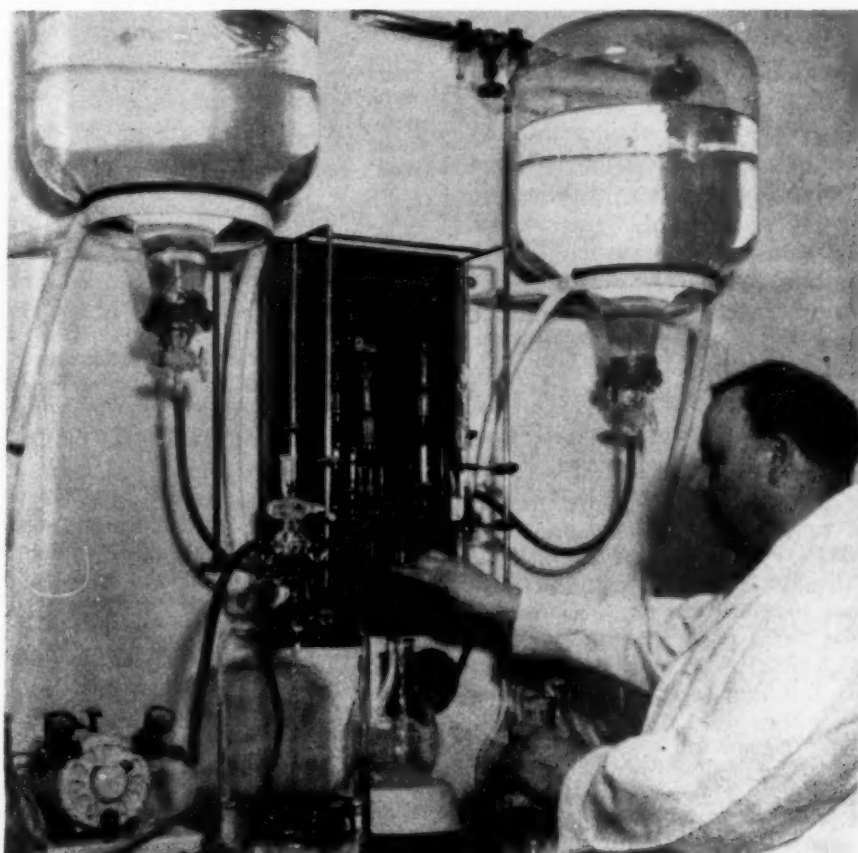
dustry should at least produce an unbreakable flask.

The type of filter thought best and most practical is the sintered glass variety which renders the solutions free of lint and undissolved material. The balance necessary certainly would not be extra equipment since the pharmacy would already have this item. A bottle washer is a time saving device to have and can be simply constructed by the maintenance department.

In hospitals of more than 100 beds, it is thought that there is sufficient need for a still and autoclave in the sterile solutions laboratory. The laboratory, as has been mentioned, should be adjacent to the pharmacy. This proximity would make supervision by the pharmacist easier if he had other duties as would be the case in a hospital up to 500 beds. One pharmacist and one helper is probably ample personnel in the laboratory of a 500-bed institution. The amount of work that can be done is practically without limit, therefore additional help may be added if the amount of work so warrants.

The scope of work can be broadened if an Arnold sterilizer and a hot air sterilizer are available to sterilize medications that should not be heated above 100° C. and those which must be sterilized by dry heat. This is equipment which might be shared by the various departments of the hospital insofar as it is used with comparative infrequency.

The laboratory should be of sufficient size so that it can be divided into three or four sections or rooms. The still and autoclave should be enclosed or recessed in one section. The storage shelves should be partitioned off. The need for these two sections or rooms is obvious when one considers the heat involved in sterilizing and the heat given off by the hot solutions. The rest of the laboratory is a work room where the washing and weighing are done. If plasma is processed, then a portion of this work room should be enclosed for a plasma room; or a hood may be installed which is equipped with ultraviolet lamps to sterilize the air. Some pharmacists



Ohio State University photo  
EFFICIENCY and absolute control are certain when needed pharmaceuticals are home made.



find the hood arrangement more practical and convenient.

Since the USP XII included plasma as an official drug, and since it is sterile medication, it too should be carried by the pharmacy in the sterile solutions department. The future bids fair to bring forth other blood fractions such as immune and convalescent sera, the preparation of which can be conducted in this section of the pharmacy. The only equipment of note that would be necessary for the plasma unit is a refrigerator. A deep freeze unit might be advantageous.

A time saving service for the nursing staff which the solutions laboratory might render, also with considerable economy to the hospital, is the manufacture of narcotic solutions in multiple dose vials to be used instead of the conventional time consuming hypodermic tablets. Often, in emergencies, there is not enough time to prepare a hypodermic and had it been ready for injection a disaster might have been averted. These state-



ments are substantiated by nursing departments wherever this procedure has been practiced.

The manufacture of allergenic medications is an additional service that the solutions laboratory can render. This arrangement allows for preparation of a great variety of material that cannot be purchased and in many cases this medication is tailor made for the patient from material furnished by the patient. Special equipment here would include a small press and seitz filters for bacteria excluding filtration; soxhlet extractors are also essential. But all of this equipment is of little monetary value. This undertaking by the solutions laboratory also results in a substantial saving for the hospital particularly since a major portion

of allergy patients come in through the outpatient department.

Sealed glass and multiple dose ampule manufacture has a limitless possibility and can be a source of considerable savings. This is a very simple procedure and much of the work involved can be done by the helper. The equipment necessary here is very little. Burettes, gas burner, and an ampule washer that can be made by maintenance, empty ampules and rubber stoppers—these comprise the bulk of needed materials.

The following groups or classifications are the medications which can be prepared in the solutions laboratory:

1. Large volume single dose solutions: dextrose and saline solutions, Ringer's solution, Hartmann's solution, sulfonamide solutions.

2. Small volume single dose solutions: Ampule solutions, sealed glass.

3. Multiple dose medication: Ampule solutions, rubber capped.

4. Diluents: Saline, dextrose, Water for dissolving drugs for extemporaneous administration, e.g. penicillin, phenobarbital, pentothal sodium.

5. Anticoagulant solutions: Sodium citrate solutions for blood and plasma.

6. Miscellaneous solutions and solids: Plasma, glycerin, powders, ointments.

Regardless of the size of the hospital, the pharmacy should be equipped to make solutions. Often the need arises for a solution that is not immediately available commercially or it might conceivably be one that cannot be purchased at all. In such an instance, if the pharmacy manufactured sterile solutions, the pharmacist would be able to prepare the desired medication or offer a suggestion if it were not practicable. There are many solutions that have to be prepared extemporaneously such as sulfonamides, penicillin, and gall bladder dye. It is well to place this responsibility on the pharmacy rather than on the nursing staff. In view of all the services and economies that can come of a sterile solutions laboratory, the laboratory is essential to an institution's harmonious functioning.

## Some Personnel Principles

**B**ROAD BUT CONCISE principles for an actively functioning personnel service department were outlined in a recent edition of *News*, the monthly four page publication of Hurley Hospital, Flint, Mich. Originator of the plan, which now functions at Hurley, is Ralph M. Hueston, hospital superintendent. It was sanctioned by Ralph E. Gault, president of the board of hospital managers at Hurley. The 425 bed hospital lists a full time personnel of 641 members.

The outline of principles follows:

1. To maintain a program for educating employees in good personnel relations:

- (a) Employee-Public: This will entail a program for all employees, and in particular those employees who have direct contact with the public.

- (b) Employee-Employee: This program to include planning group events and organizing recreational activities which will develop good relations among employees.

2. To interpret procedures to employees: This will be a continuing program. When an employee makes a request to a supervisor for information regarding a hospital procedure, that supervisor shall route the

employee to the Personnel Service Department. The purpose of this policy is twofold: First, to save the time of the supervisor, and second, to maintain a central service of information.

3. To maintain an orientation program: This program has been organized for present as well as new employees, but eventually will be maintained only for new employees. The purpose of this program is to familiarize employees with the aims and objects of Hurley Hospital and to emphasize such information as is contained in the first half of our booklet "You and Your Job in Hurley Hospital."

4. To maintain a counseling service:

- (a) Opportunities for advancement: The Personnel Service Department will maintain a record of the employee's previous training and experience for reference to determine the employee's eligibility for advancement, and will counsel with the employees regarding opportunities for advancement.

- (b) Personal matters: Some employees prefer to discuss personal matters with someone other than their immediate supervisor. The Personnel Service Director's office may be used for counseling employees on personal matters.

5. To publish a monthly news letter for the employees of Hurley Hospital.



FOR efficient service, the dispensing unit of the pharmacy should be located in the vicinity of the exit from the outpatient department.

## MEDICATIONS *for* OUTPATIENTS —*Operating a Successful Dispensary*

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ANY CONSIDERATION OF the policies and problems met in providing medical supplies for ambulatory patients necessarily involves a number of related factors which tend to operate with varying degrees of importance in as many combinations as there are different hospitals with outpatient services. An attempt will be made to illustrate and evaluate those factors in terms of their application in some of the more general combinations. It is necessary to establish some basic concepts before proceeding to a discussion.

Three different types of hospitals with outpatient facilities are generally recognized. One group is comprised of government operated and supported institutions representing city, county, state or federal projects. In the main, outpatient services in these institutions operate in behalf of the totally indigent patient. This is not the case with federal institutions. The fact that the disabled, chronically ill veteran receives his medical care at the expense of the government places such institutions in the general category.

In communities there are a large number of privately endowed,

charitable, nonprofit voluntary hospitals. Frequently, city, county or state aid is extended to them but their operation remains essentially under the control of a group of private citizens. Where outpatient services are sponsored by such institutions—this includes institutions which are exclusively outpatient clinics—care is extended, almost without limitation, to patients whose economic status places them somewhere in the partial to completely indigent category.

The third type of hospital with an outpatient service is the private institution, operated expressly for profit. In these institutions, the indigent patient is not acceptable.

**Location**—It is recognized that an established hospital can do little in the way of changing its structure to meet the most desirable conditions for handling patients with medication requirements. There are instances, however, where minor physical changes can be made which will pay dividends in good will.

It has been observed that, no matter how trying a day a patient may have spent in the clinics, if a number of factors are given full consideration and every possible step taken to assure their adoption

as dictating basic organization and operation policies, patients will leave the hospital with a grateful, kindly attitude.

These factors may be summarized as follows: The business of providing medical supplies prescribed, which incidentally represent a major part of the treatment, is to be accomplished with dispatch and utmost courtesy. Clear, explicit instructions for use are to be provided in writing and verbally by sympathetic personnel. Any other time consuming functions which are required—such as the collecting of funds—are to be accomplished with expediency. At all times, the concept is that the patient is ill and cannot be made to wait, especially after a tiring examination in the clinic.

If this summary is taken as a principle guiding the establishment of policies of organization and operation, the service of a dispensary to its patients will be notably enhanced. However, if one of the components of this principle should be ignored, there is a likelihood that patients will leave the hospital ungrateful, emotionally disturbed and bearing ill will. It need only be pointed out that any non-adver-

This discussion is recognized by the author to be a unilateral presentation, not necessarily embracing the ideal under circumstances differing materially from those with which he is familiar.



tising hospital depends on word-of-mouth goodwill to make successful its usefulness. The last impression a person gains is frequently a clear impression which may overshadow all others. Consequently, the location of the department of pharmacy, or a well equipped dispensary, in the immediate vicinity of the patient exit from the outpatient department is advocated so that the receipt of medical supplies may be accomplished with dispatch and without unnecessary steps.

It is urged that a large well ventilated and lighted waiting room be provided especially equipped with comfortable chairs or benches. These are particularly indicated for mothers with young children, aged, debilitated, obstetrical, cardiac, arthritic or otherwise painfully crippled patients. Smoking facilities should be provided if ventilation is adequate. If the operation policy entails a considerable wait, reading facilities supplied with magazines for adults or picture books for children are desirable.

**Dispensary Organization and Operation Policies**—The dispensing unit of the department of pharmacy should be organized so that the factors enumerated here may be accomplished with minimal effort. Physical separation of the outpatient dispensing service from other departmental activities is advocated. It is desirable to provide the semi-open type prescription compounding center where patients may see that attention is being given their prescription. It is mandatory that the section of the dispensary within the patient's visual range be immaculate and orderly. A bit of showmanship is indicated for this area where the ultimate in professional atmosphere should prevail. Incidentally, a busy dispensary cannot operate without some disturbance. Therefore, it is necessary that a partitioned area be provided, or a section totally separate, where the actual work of compounding can be done.

For the past 13 years we have advocated the use of the formulary system in hospital pharmacy.<sup>1</sup> We are proponents of this system for a number of reasons, especially since it provides for advance preparation

of medical supplies in calculated dispensable unit sizes. This system serves to expedite dispensing in a remarkable fashion; the experiences of numerous hospitals have borne this out. Dispensable unit sizes are arrived at by consideration of the following factors:

1. The clinic (s) where an agent is prescribed.

2. Average interval between appointments, in days, in those clinics.

3. Usual number of doses per day.

Some hospitals operate on a non-formulary system, permitting diversified prescribing. A discussion of this situation has been presented elsewhere.<sup>1</sup> There is one obviously important aspect of this manner of operation which impedes dispensing—almost every prescription received must be individually compounded. This not only requires expensive personnel time but also lengthens the waiting time of the patient. Compounding pharmacists, in such circumstances, are consistently under pressure. Pharmacists compounding prescriptions under pressure do exceedingly poor work which may lead (and has led) to serious errors. We cannot tolerate compromise with accuracy for expediency. The only acceptable alternative is the formulary system or a similar plan.

A third plan of operation is that which employs a combination of the formulary system and extemporaneous compounding. This method is by far the most satisfactory provided extemporaneous prescriptions are maintained at a minimum. The object of the extemporaneous prescription is to take care of those exigencies which, because of their nature, are embraced with difficulty in the formulary. Provision should be made in the formulary, however, for the basic ingredients acceptable to the formulary committee in permitting this latitude in prescription writing.

If the method of extemporaneous compounding is employed, a section of the dispensary must be com-

pletely equipped with all necessary prescription ingredients and facilities for compounding prescriptions accurately and efficiently. Such a method must employ a checking system whereby each prescription compounded is checked as to composition by the compounder with another pharmacist. Each prescription so compounded should be signed by both pharmacists. Adequate numbers of pharmacists must be retained to minimize the prescription load.

Where the formulary system is employed, stated unit sizes of each agent available are usually mentioned in the formulary. Supplies are prepared in bulk by pharmacists in the manufacturing division and packaged in dispensable units by non-professional assistants working under the active supervision of a pharmacist. From the moment packaging is completed they should bear identification labels. One of the best procedures is the use of a "tab" label bearing title identification on each container. The identification may be removed when a prescription is dispensed. Frequently "direction" labels are also placed on each container. Some hospitals employ code numbers on these labels for emergency identification. This method has merits provided care is taken when dispensing to check the code numbers. Such numbers should not be employed for prescribing purposes.

It is a matter of policy that items of a proprietary nature should not be dispensed under the manufacturer's label. This policy cannot be exercised fully, for limitations exist. It is most desirable, however, that the prescription character of a medication be maintained if at all possible by employing regular prescription labels. Furthermore, it is undesirable to advertise any manufacturer's products through the medium of a charitable outpatient department.

Where policy embraces a combination of advance and extemporaneous preparation of medical supplies, extemporaneous compounding can best be accomplished outside the busy dispensary. The ideal location is the general hospital dispensing laboratory. If such a prescription is prepared outside the dispensary, it should be requisi-



<sup>1</sup>Clarke, Donald A. "The Formulary System," *Hospitals*, March 1941.



tioned by the dispensary when completed. However, if drawback of tax paid for alcohol used in ambulatory patient medication is contemplated, extemporaneous prescriptions must be compounded in a unit segregated from inpatient work.

A greater amount of professional personnel time is required in the actual process of dispensing where extemporaneous compounding is employed. Where the formulary system operates satisfactorily, the mass of medical supplies can be prepared in the manufacturing laboratories by one pharmacist with non-professional assistance in packaging and labeling. One manufacturing pharmacist can keep a busy dispensary well supplied. The entire question of whether or not the formulary system may be employed hinges on rationalization of therapy and elimination of nonessential individual variations from prescription to prescription. Professional personnel time saved as a result of using the formulary system can be utilized to great advantage by applying it to improvement of the total pharmaceutical service to the institution and its patients.

### **Advance Supplies**

If the formulary system is employed, the manufacturing pharmacist should maintain at least a month's supplies in advance of need. The precarious situation of hand-to-mouth dispensing can thus be avoided. Such supplies should actually be ready for dispensing. Experience alone, with careful evaluation of trends or seasonal demands, can establish what represents adequate advance preparation. The annual report from the department of pharmacy, a subject which will be discussed in another of this series of articles, is an excellent way of obtaining such information. Once packaged, supplies should be placed in a storage area adjacent to the dispensary. The storage space should be retained solely for these supplies. There the supplies should be carefully arranged, protected from dust and undue exposure and ready for use.

In the dispensary, adequate shelving, drawer and cabinet space is required to maintain at least one day's maximal requirements for

each item frequently prescribed in the unit sizes required. An adjustable shelving section, preferably in the visual range of the patient, should be provided for stock bottles of those formulary prescriptions for which there is insufficient demand to make desirable advance preparation for dispensing. Another section must be provided, preferably a small prescription counter, for dispensing these supplies as called for.

The dispensary, according to law, must have an individual cabinet of acceptable type for storage and maintenance of a supply of narcotic drugs separate from the supply maintained for the hospital inpatient service. A refrigeration unit must be readily accessible for storage of supplies which lose potency at room temperature. A small, apartment size refrigerator is ideal.

A numbering machine should be provided for numbering prescriptions consecutively. A file bearing information as to dispensing prices for each item in the department that might find its way into O.P.D. channels, including a breakdown for unit sizes, should be provided. Such a file should be placed within easy access of the dispensary operator. A file of this type is not necessary if flat rates are employed. The utility of a pricing file may be improved if it is divided into two parts. One part is for active material; the second part is employed as a repository for infrequently prescribed materials. In addition to the pricing file, a policy should be clearly defined concerning steps to be followed in reaching a top price for extemporaneously prepared prescriptions. Deductions, following an established pattern, can be made from the top price in accordance with the patient's ability to pay.

A cash register should be provided for collection of fees. Such a cash machine should possess three features: It should be equipped to stamp on the prescription blank the amount of money collected; it should run a tape on the monies so deposited and, for accounting control, it should throw out a check bearing the sum rung up which should be presented to the patient with the prescription. If funds are collected by an O.P.D. general cash-

ier outside the department, then such a machine should be used in the dispensary to stamp the cost on the prescription, total the amount collected for the day, determine whether prescription prices are adequate to cover operating costs, and for an accounting check on the general cashier collections.

### **Adjustable Shelves**

Where extemporaneous dispensing is employed exclusively, the entire area should be devoted to shelves of adjustable character for stock bottles of required galenicals. In other respects, the equipment required is essentially the same, with the exception that the prescription counter must be sufficiently commodious for the extensive compounding activities.

**Personnel Requirements**—It is impossible to state that "so many prescriptions a day" require a definite number of personnel. It has been observed in one outpatient department operating on an extemporaneous compounding basis that 200 prescriptions a day require the time of five pharmacists preparing prescriptions plus the attention of one non-professional worker to keep stock bottles filled while the clinics are functioning. This may be contrasted with an outpatient department operated on the formulary system where 350 prescriptions are handled daily by one pharmacist and the supplies maintained by one non-professional worker and part of the time of a manufacturing pharmacist. The non-professional worker packages galenicals, labels, maintains storage and transfers to dispensary from storage unit on a daily requisition.

Personnel appointed for dispensary work must be selected with care. Primarily, they must enjoy meeting the public, be neat, speak fluently and clearly the prevailing language, be sympathetic with the vagaries of human nature, possess compassion for the ill and indigent and be capable of conducting themselves in a dignified and professional manner.

*(In a subsequent issue of HOSPITALS, accounting procedures and the legal aspects of providing medical supplies to outpatients will be considered.)*

# MEDICATIONS FOR OUTPATIENTS: II

## —Accounting and Legal Requirements

**I**N INSTITUTIONS WHERE fees are collected for medical supplies the policy covering this question is most important. An outpatient dispensary capable of collecting revenue should adjust its revenue producing ability in such a way that the costs of operating the unit can be met. These costs of operation should be spread over the individual patient's ability to pay on a calculated basis. To be assured of such an accomplishment, the dispensary must be operated as a separate accounting unit.\* To realize this, the following information and procedure is necessary:

1. Material cost (including labels and containers) arrived at by use of standard cost accounting methods.<sup>1</sup>

2. Labor costs.

3. Indirect costs (including maintenance, administrative costs, licenses, bondage, breakage or loss and so forth).

4. The use of requisitions for all supplies entering the dispensary from the main pharmacy; these requisitions are evaluated by overall costs for materials (material, labor and indirect costs) by standard cost accounting methods.

5. A physical inventory conducted at the close of each month and evaluated by standard cost accounting methods.

When operation costs have been established, patient ability to pay may be resolved. Institutions have been encountered where social service departments have arbitrarily established what a patient should pay for a prescription without knowledge of actual cost. There are numerous methods for handling this problem in practice.

\*Reference is made to the use of "requisitions" or a "requisition system," in which instances the concept of a separate accounting unit is implied.

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There is considerable objection to the method just described.

On the other hand, one is favorably impressed with a system whereby social welfare workers interview patients upon admission to the clinics and at regular intervals subsequently, weigh carefully their financial status and responsibilities and, with this information at hand, assign a "rating" based on actual ability to pay for outpatient department services. This rating applies for all services and reflects accurately the patient's financial capabilities. The principle of fees from outpatients is predicated on an attempt to perpetuate endowments for the continued good of the community as well as to maintain self-esteem in the patient by mapping out a schedule of payment he can meet without overtaxing his financial resources.

Given "ratings" of the type described, studies may be conducted on the dispensary prescription volume to learn the ratio of patients capable of paying full costs to others capable of paying only fractional costs or nothing at all. Such "spot" surveys may be conducted at intervals to test an established ratio. Once the ratio is learned, distribution of costs may be established and applied to each prescription. The method is simple and effective.

Another procedure may be employed. With operating costs and prescription volume known, two classifications of patients may be

established—those capable of paying a nominal fee and those incapable of payment. The former group must carry the burden. For a stated period of therapy (medication for one week, for instance) a flat fee may be established for all such patients, irrespective of cost of the individual prescription, provided the total fees collected cover the costs of operation.

A third method, more recently obtaining popularity in the United States, is group comprehensive medical care for low income groups. To apply this principle successfully to medical supplies it is necessary to have at hand actual operating costs of a dispensary and be able to apply those costs to a prescription. Outpatient departments operating on this general plan set yearly fees for their patients. The insurance principle is applied that any individual of a group shares equally with another the total costs of the comprehensive medical care of the group, the cost to the individual being nominal.

In a well-organized hospital pharmacy, where operating costs of a dispensary are spread over ability to pay, it must be a guiding principle and will generally be found the case that partially indigent individuals who carry the burden are required to pay extremely modest fees in comparison to private medical care which is beyond their reach.

At all times there is a significant number of selected, completely indigent patients in our community. Various welfare agencies, either private or public, have established procedures whereby private, charitable institutions are compensated in part





for medical care given such patients.<sup>2</sup> Where such patients must be verified as recipients of assistance at the same time medical supplies are provided for less dependent individuals, segregation has been found to be not only desirable, but also most effective for it eliminates checking authorizations and so forth from the vicinity of the busy dispensing unit. These dependents may receive medical supplies at a specified desk without embarrassment. If the volume is sufficiently great, a fulltime worker may be assigned this duty.

One of the greatest burdens of a busy pharmacist is collecting fees. The efficient organization provides a cashier for all O.P.D. collections near the entrance to the clinics and thus near the "ideal" location for the dispensary. Since collection of fees is an important function in the outpatient departments of many institutions, it is suggested that while medication is prepared, the patient be given the receipt slip from the cash machine in order to pay the cashier. On the same slip the prescription number may be stamped (using a numbering machine set to duplicate) for identification purposes when he returns. The cashier may stamp "Paid" across this slip. On the patient's return, the slip is presented and the medication dispensed with verbal instructions, as well as the written ones on the label. This procedure would serve two purposes: (1) eliminate making change and collecting money in the dispensary, and (2) keep the patient partially occupied while he is waiting for his medication.

#### LEGAL REQUIREMENTS

A pharmacy operating in a hospital should be registered with the state board of pharmacy. Several states have this requirement. Many hospitals have proceeded on the interpretation that a physician may have on his person or under his jurisdiction the medical supplies he needs and may dispense these where and when he sees fit. Consequently, a number of hospital superintendents are physicians. With the latter point there is no argument. It is felt, however, that every hospital should avail itself of the protection provided by registration with the local board of pharmacy.

Registration with a state board of pharmacy automatically carries the requirement that the medical supplies be stored and dispensed by a registered pharmacist. Well trained, competent personnel must be employed because an error, even though casual, may result in death. An error by personnel lacking legal and educational qualifications could not be sustained in court. A hospital which has taken reasonable precautions in supplying adequately trained personnel would have a far more favorable legal contest if an error should occur.

The Federal Narcotics Act, by recent interpretation, requires that a separate inventory of narcotic drugs be maintained in a dispensary separate from an inventory employed for inpatients. Narcotic drugs are requisitioned and purchased separately under a separate class number. They must be stored in the dispensary in a unit meeting legal requirements for safety.

Institutions dispensing medications to patients to be used off the premises must compound those containing alcohol with tax-paid alcohol. The only exception is the charitable institution which collects no fees. This federal law, recently invoked, is a serious handicap to charitable institutions. Any hospital which seeks to evade this provision by subterfuge is asking for trouble. Essentially the provision levies taxes on charity where charity is accomplishing the greatest job and this principle must be opposed. (See *American Professional Pharmacist* for May, June, July and August 1946.)

There are a number of advantages in using a requisition system for an outpatient dispensary. One is that the requisitioning of all supplies used through O.P.D. channels permits an accurate accounting of the tax-paid alcohol used. This information is essential to claims for partial drawback of tax paid for alcohol used in these supplies. Separate compounding with galenicals made from tax-paid alcohol is requisite and a separate compounding unit is therefore desirable if the extemporaneous method is employed. If the formulary system is employed, bulk manufacture using tax-paid alcohol must be separate from that which employs tax-free alcohol.

This necessitates a separate storage area for finished galenicals.

#### LABELING

It has been pointed out earlier that materials being dispensed to patients must bear instruction labels. There are three methods commonly used for labeling with instructions. The best method is not necessarily the most practical one. It is believed that each label for each prescription should be individually prepared as the prescription arrives at the dispensary. It should bear adequate and complete identification as well as adequate instructions for use. Special emphasis must be placed on the labeling requirements for narcotic prescriptions. Such labels should be prepared by typewriter, for handwriting is frequently difficult to read and becomes smeared readily. Instructions, if at all possible, should be written in the language spoken by the patient.

There are two hospitals, with which these writers are intimately acquainted, preparing labels as the prescription arrives. One hospital operates on the formulary system. Packaged galenicals are prepared in advance of demand and are identified by "tab" labels which may be pulled off prior to dispensing. The other hospital employs extemporaneous compounding. In our opinion, any hospital that has sufficient time for extemporaneous compounding has no justification for not using individually prepared labels similar to those described.

Labels for medicines to be used externally will bear proper distinction from those labels used for internal medication. Usually, a legend "External Use" is used and the entire label printed in red ink. For materials, a small quantity of which may prove fatal if ingested, the actual designation "Poison" is desirable. Containers for external medications which are different from containers used for internal medication may be employed with advantage.

It is necessary to point out the Federal Food and Drug Administration has recently ruled that one internal medication which is potentially dangerous to life or health when dispensed as a prescription must bear such a warning on the



label. Although it is believed this opinion is not the last word because a better method for cautioning patients exists, as long as it remains the opinion of the FDA, it is necessary to conform to it. In the case of thiouracil, FDA advocates that the warning on the manufacturer's package be copied verbatim and placed on the prescription package. Similar interpretations might be expressed for phenyl cinchonic acid derivatives, the sulfonamides, barbiturates and so forth.

Some hospitals employ a method of labeling whereby the instructions are printed on the label in part by a printer. Where variables occur such as "number of times a day" or "when" the medication is to be taken, or "how much," blanks are left to be filled in by the compounder. On such a label an identification code number may be printed in the body of the label which may be used instead of other means of identification provided supplementary precautions are taken.

A third method for labeling prescriptions is not considered satisfactory. A prescription blank is used which has a short perforated bottom section. On this section is placed a number of blank spaces for "fill ins" and a number of words which may be used or crossed out. At the bottom of the perforated space is a place for the physician's signature. At the dispensary, this perforated

section is removed and placed on the container of medicine. One disadvantage in this method is that the dispensary retains a prescription with neither the physician's signature nor his original instructions. The prescription is a legal document as long as it possesses the generally accepted requisites. To lose these two important features makes the prescription, in essence, a worthless piece of paper from the legal point of view.

Whatever method of labeling is employed, precautions for narcotic prescription labels, FDA classified dangerous drugs requiring warnings and external preparations must be observed in proper accord with legal requirements or public safety.

#### THE PRESCRIPTION

The basic concept that a prescription is a legal document in law must, at all times, be uppermost. Recognizing the federal requirement that a narcotic prescription must be retained on file for two years, it appears desirable to keep all prescriptions on file for a similar period of time or longer. If drawback of tax paid for alcohol used in outpatient prescriptions is contemplated, Regulation 29 of the Treasury Department stipulates that all pertinent records must be retained on file for a period of at least three years. Prescriptions constitute such records. Because of the status of the prescription, it should

be protected in filing from ordinary forms of destruction. Steel filing cabinets seem adequate. Current year prescriptions should be kept readily available as should two years of narcotic prescriptions. Other than current year routine prescriptions may be placed in dead storage unless "refilling" is permitted.

The accompanying figure illustrates a summary of daily O.P.D. activities. One convenient feature of such a summary is that the "block" of prescriptions covered by the date of the summary is given. This is convenient information when seeking a prescription in file, provided the summaries are filed in an accessible manner.

At this point it is desirable to express an opinion on prescription refills. Many hospitals grant this privilege. It is the opinion of these writers that no hospital can afford to permit this practice where there is an active outpatient department. It is believed that the general welfare of a patient depends, not on chronic medication, but on frequent examination with prescriptions designed to meet current problems.

In teaching hospitals, permitting the refilling of prescriptions takes the patient out of the teaching material class. It is desirable that medication being received by a patient be reviewed by others than the original prescriber.

There is another aspect to be considered. An entry in a patient's history must be made every time the patient is seen and a summary given of all facts of the visit including medication prescribed. This is the record of therapeutic management of the patient. This, also, may become a legal document. If refilling of prescriptions is permitted without entry in the patient's history, the therapeutic program loses most of its value in subsequent management.

Progress in medical management of any patient is not achieved by placing the patient on medication and then losing control of the patient. There are a number of drugs currently available which are capable of producing serious harm if indefinite use is permitted. It is advocated that every time a patient returns to the clinic for medication he be seen by a physician and a prescription written if indicated. Pro-

<b>THE BLANK HOSPITAL</b> Outpatient Department « » Pharmacy Copy to: Comptroller			
Ending Prescription No. _____	Date _____		
Starting Prescription No. _____	Register Total \$ _____		
Prescriptions Used _____	Adjustments \$ _____		
	Adj. Register Total _____		
	Over / Short _____		
Paid Prescriptions \$ _____	Cash Deposited \$ _____		
Free Prescriptions \$ _____			
Total Sales Value \$ _____			
_____ Chief pharmacist	<div style="border: 1px solid black; display: inline-block; padding: 5px 20px;">Register Total</div>		

DAILY SUMMARY of prescription transactions: this form is designed to be used with a cash machine that will print a total, lower right. Adjustments are made from that total.

vision should be made to supply adequate quantities of medical supplies to permit long appointments, if such should be desired in isolated instances.

The information to be contained on a prescription essential to identification is important but can be overdone. There are hospitals which require too much information on the written prescription. Legible writing is essential. The prescriber should fill in the patient's name and history number as a matter of identification for the safety of the patient.

The body of the prescription is necessary and the use of acceptable official nomenclature is most important. Adequate instructions for use are imperative. Prescriptions with no instructions or the "as directed" inscription are lamentable. Frequently patients forget verbal instructions from the physician. The physician's legal signature must appear on the prescription. In addition, the compounder and checker, if the extemporaneous method is employed, should each sign the prescription. If a narcotic prescription is executed, full information required by law must appear on the prescription. As a matter of policy, it has been found desirable for the individual dispensing the narcotic prescription to identify these prescriptions with his initials.

Outpatient departments usually employ some form of clinic card which is assigned to the patient for identification purposes. If some of the identifying information is missing when the prescription arrives at the dispensary, such as patient's address or history number, that should be filled in by the compounder.

In the writing of prescriptions, the use of numbers for indicating composition is not good. It is unimpressive, unintelligent and lacking completely in educational value. The use of full descriptive titles should be advocated and insisted upon. Patient safety is adequate justification for this conviction.

One hospital, for instance, employs an ideal system for conveying the written prescription to the dispensary. A system using tubes about 6 inches long operates from each clinic and terminates in the dis-

pensary where there are a series of small receiving stations. Prescription blanks have a perforated section along the right edge with a number identical with a number on the prescription, instructing the patient how to reach the dispensary and informing him that the medication may be obtained there. This perforated section is removed and given to the patient.

The prescription is tubed to the dispensary, arriving well in advance of the patient. This method gives the pharmacy additional time to have the prescription ready for the patient when he arrives. The method represents foresight in planning. For the patient, waiting time is minimized. The hospital is assured of whatever revenue may be realized from the prescription, if fees are collected. The lower fees possible are of considerable advantage to the patient. The method works equally well with the formulary system or the method of extemporaneous preparation.

#### THE HOSPITAL'S OBLIGATION

It is needless to point out the obvious obligations of the community hospital to the population it serves. The indigent or semi-indigent patient must receive excellent medical supplies at minimal cost or free, if necessary. Not only must the quality of medical supplies be unquestioned, but the execution of the prescription, presentation of the medicine, container, labels and instructions all must be of top quality with every consideration for the convenience and safety of the patient. Hospital dispensaries exist where these factors are not accurately

weighed and such conditions need correction.

Not infrequently there is animosity present among retail pharmacists who look upon the hospital dispensary as unfair competition in the distribution of medical supplies. In this respect the retail pharmacist must be reminded that the role of the charitable hospital in his community is unique.<sup>3</sup> The private hospital is a strict business venture intent on profit from investment and is as much entitled to solicit business of this type from the community as is the retail pharmacy. The charitable hospital, however, must make every effort to be assured its patients are in the position requiring its kind of assistance. If a hospital practicing charity is careless in classifying the patients admitted to its clinics and a number of financially independent patients are permitted to attend, the private physicians and pharmacists of the community have a justifiable complaint.

A hospital should have on its staff the most competent individuals available for each specialized activity. To obtain high quality medical supplies, efficient organization of medical supply service and the other factors requisite to proper execution of the pertinent features of this obligation, and to do so at minimal cost to the hospital, a well trained hospital pharmacist is needed.

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# Statistical Analysis Shows Several Thousand MORE PHARMACISTS NEEDED

SOME TIME AGO a tragedy occurred in one of our hospitals. Boric acid had been supplied to the nursery instead of milk sugar. Feeding formulas prepared with the drug resulted in the death of several infants. In the investigation that followed, evidence brought out the fact that non-professional personnel were employed to carry out duties for which they had not been trained. I wonder if this is not an indictment of the administration of the hospital rather than of pharmacy.

This brings up the question: How many pharmacists are needed in the hospital? The answer is simple: Enough to insure the patient complete pharmaceutical service. The problem of determining what is complete pharmaceutical service, however, is another matter and not quite so simple.

Why should an individual, on becoming a patient, receive inferior pharmaceutical service? Members of the medical staff in their practice outside of the hospital insist that their patients have the services of the best trained pharmacists, but all too often they overlook and accept poor pharmaceutical service given their patients in many hospitals. Complete pharmaceutical service would require a pharmacist for the following duties:

1. Compounding of prescriptions.
2. Dispensing pharmaceutical floor supplies.
3. Supplying chemicals, drugs and pharmaceuticals to other departments of the hospital, such as laboratory, surgical, x-ray.
4. Manufacturing of pharmaceutical preparations. A good many pharmaceutical preparations used in the hospital at the present time

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can and should be manufactured by the pharmacy department. Most of these can be manufactured at a saving over the market cost.

5. Purchasing of all pharmaceuticals, drugs and chemicals. As the pharmacist is legally responsible for the purity and potency of the pharmaceuticals he dispenses, he should be permitted to purchase these supplies. Far too many pharmaceuticals are purchased for hospitals by their purchasing departments on a bid and price basis rather than on quality standards.

Should the hospital be a teaching institution, there are many other duties for the pharmacist if the hospital is to give complete pharmaceutical service. These duties affect the patient's welfare only insofar as they make for better hospital service.

The duties would include: Teaching materia medica and pharmacology to student nurses; lectures and discussion periods with the medical intern; acting as a technical consultant to the physician; maintaining a complete pharmaceutical reference library for the use of the physician, intern, student and graduate nurse.

In a hospital that gives complete pharmaceutical service the hospital pharmacist must then be a compounder of prescriptions, an educator and a purchasing agent. With these duties in mind how can we

determine the number of pharmacists needed now and for the next few years? In order to determine this figure I have taken eight general teaching hospitals as a basis for computation. The list includes one each from Milwaukee and Cleveland and six from the Chicago area. While the pharmaceutical services offered in these hospitals are not identical, they come as close as can be expected.

An analysis showed that these hospitals have a total of 2,249 beds and employ 19 pharmacists. This means one pharmacist for every 118 beds. Latest available figures give a total of 1,729,945 hospital beds. With a pharmacist needed for every 118 beds there then is a need for 14,665 pharmacists in all hospitals. There are at present some 3,400 pharmacists employed in hospitals. This would show a need for 11,265 additional pharmacists. This is not a true picture, however, as in many types of hospitals a pharmacist could service more than 118 beds.

If we consider the total beds in general hospitals, 925,818, it would require, at the rate of one pharmacist for 118 beds, 7,846 pharmacists to supply complete pharmaceutical service. Figures for 1944 published in 1945 give a total of 4,833 general hospitals. Of these, 3,618 reported 1,535 pharmacists employed, which leaves about 2,000 hospital pharmacists who may or may not be employed in general hospitals. If we then accept as fairly accurate the estimate that 118 beds require one pharmacist, it would be safe to say that there is a need for approximately 10,000 hospital pharmacists.

I believe that it would be fitting in a discussion of this character to consider the small hospital with reference to pharmaceutical serv-





ice. Recently several states have passed laws, or have had existing laws interpreted, requiring the dispensing of pharmaceuticals and such under the supervision of registered pharmacists. The administrator of the small hospital is then confronted with an economic problem that must be solved.

There are several solutions that can be offered. There is a theatrical expression, "doubling in brass." Why can't the same be applied to the small hospital? As the actor and stagehand played in the band for

the road show parade, so can the hospital pharmacist take on other duties.

Since the pharmacist is familiar with rubber goods, gauzes and bandages, surgical instruments, and the like, he could well take over the purchasing, storeroom and perpetual inventory. With some training the hospital pharmacist could act as a laboratory technician as well as x-ray technician.

Another solution within the realm of possibility is the use of one pharmacist for two small hos-

pitals. If the hospitals are not too far distant and with automobile transportation, complete pharmaceutical service could be given in the forenoon for one hospital and in the afternoon for the other. It is not impossible for the small hospital to give complete pharmaceutical service.

All the facilities of the American Society of Hospital Pharmacists are available to the administrator, hospital pharmacist and medical staff in their effort to solve pharmaceutical problems of the hospital.

## PHARMACY COMMITTEE (Continued from page 21)

edly awry, the disadvantages which can be cited against the use of this body are much less numerous than the advantages enumerated above. Objections could be raised on the following points:

1. The administrative routine or procedure may be slowed if one must work through a staff committee.

2. Some flexibility of therapy may be sacrificed, as changes in routines cannot be made so quickly when needs must be requested through a committee. Provision must always be made to cover emergencies, however, and by so doing necessary flexibility can be maintained.

3. Investigative work may be retarded. An occasional physician may desire to investigate or com-

pare values of certain agents, but hesitate to request supplies from a group of his colleagues. Such an effect certainly is not the intent of existing pharmacy committees and they have, at least in most cases, made provision for research. It is controlled research to be sure, but I do not believe either the patient or science suffers as a result.

4. If such a committee functions actively and progressively it might, in some instances, introduce friction among individual members of the staff.

If set up and permitted or induced to function as outlined, there should be no hesitancy in considering the pharmacy committee a welcome adjunct to the organization of the hospital. Certainly it will be found to be one of the most

active and industrious of all staff committees and, if its efforts are successful, much will be done toward giving the patient the most effective care possible for his money.

1. Spease, Edward; Minimum Standard for a Hospital Pharmacy; *Hospitals*, June, 1936, p. 75.

2. Clarke, D. A.; The Formulary System; *Hospitals*, March, 1941, p. 93.

3. Report of Committee on Pharmacy, Transactions of American Hospital Association, 1937, p. 154-180.

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APRIL 1946, VOL. 20

# SPECIALIZATION

## *Hospitals Need Training Program for Pharmacists*

**I**F HOSPITALS are to insure a supply of adequately trained pharmacists to manage their pharmacy departments, the hospitals themselves must establish training programs for those pharmacists who wish to specialize in the hospital field.

Every hospital is entitled to the professional pharmaceutical service that only a specially skilled hospital pharmacist can provide. Where can the pharmacist obtain proficiency in this specialty? Where can the administrator who wishes an individual with this specialized experience obtain him? Unfortunately, there are few hospitals now offering training in hospital pharmacy practice. Thus, at present, an insufficient number of pharmacists are proficient in the hospital field.

Training for a hospital career is a well recognized, but often overlooked, function of the hospital. The hospital carries out this responsibility in many fields: In medicine, in nursing, in dietetics, in administration, in x-ray technic, in physical therapy, in biochemistry, bacteriology and serology and in



ONE OF her tasks as an intern in hospital pharmacy is to fill prescriptions carefully.



**DON E. FRANCKE**

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pastoral care, as well as in pharmacy.

The recent trend of state boards of pharmacy to require medicinal agents to be compounded and dispensed under the supervision of a registered pharmacist in hospitals has greatly emphasized the need for additional pharmacists proficient in hospital practice. What institution is better equipped than a hospital, or has more qualified personnel, to train an individual for a career in hospital pharmacy?

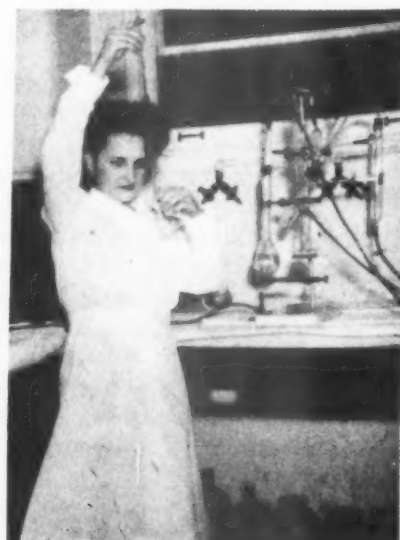
The recent graduate in pharmacy, like the recent graduate in medicine, cannot be considered a finished product. He has only a broad general background in a highly specialized field. Training and experience are necessary before he can practice successfully.

Colleges of pharmacy emphasize the preparation of students to practice in the retail field. Scant attention is paid to preparation for hospital practice. The practice of pharmacy in hospitals differs so greatly from that in the average retail store that the recent graduate—trained for and experienced in the retail field—is not prepared for hospitals.

In addition, hospital pharmacy is closely related to the functioning of the hospital as a unit. To illustrate this point and to suggest the type of training required for successful practice of pharmacy in the hospital field, I present the accompanying outline prepared by Mrs.

Evlyn Gray Scott, chief pharmacist at St. Luke's Hospital, Cleveland, and used by her in the training of the hospital pharmacy intern. This outline emphasizes not only the specialized technical training and experience offered but also illustrates the essential administrative experience required for successful hospital practice.

The need for the immediate future in the training of hospital pharmacists is the establishment of additional training centers and the adoption of a basic training program in hospital pharmacy. A fundamental training program for hospital pharmacists is now being formulated by the Minimum Standards Committee of the American Society of Hospital Pharmacists under the chairmanship of Donald A. Clarke, apothecary-in-chief of the New York Hospital. When the report of this committee is completed, the success of the implementation of its recommendations will depend greatly on the interest and cooperation shown by hospital administrators.



A NITROGEN determination on an allergenic solution is run by this pharmacist intern.

# A GENERAL OUTLINE FOR THE HOSPITAL INTERN PHARMACIST

## **Introduction:**

1. History of hospitals.
2. Functions and classifications of hospitals.
3. Organization of the hospital.
  - a. Business and professional responsibility.
4. Training in the pharmacy department is divided into
  - a. Administrative training.
  - b. Pharmaceutical training.
  - c. Educational training.

## **I. Administrative Training**

### **A. General**

1. Supplies (pharmaceutical, chemical and equipment).
  - a. Stock control.
  - b. Purchasing.
    1. Specifications.
  - c. Receiving.
  - d. Distribution.
2. Laws and regulations.
  - a. Government.
    1. Pure Food and Drug Act.
    2. Harrison Narcotic Law.
    3. State Narcotic Law.
    4. Local safety regulations.
  - b. Hospital regulations.
    1. Standing orders.
    2. Medical intern's manual.
    3. Nursing procedure book.
    4. Pharmacy department.
3. Licenses, forms and records.
  - a. Government.
    1. State pharmacy licenses.
    2. Narcotic—federal and state.
      - a. Hospital license, records and yearly report.
    3. Alcohol, tax free.
      - a. License, bond and monthly report.
    4. Stills, registry.
  - b. Hospital forms.
    1. Pharmacy department.
    2. General.
  - c. Accounting records.
    1. Invoices.
    2. Credits.
    3. Charges.
    4. Inventory.
  - d. Personnel records.
  - e. Statistics.
    1. Yearly report.
4. Pharmacy budget.

## **B. Supervision**

1. Job instructor training.
  - a. Getting ready to instruct.
    1. Timetable.
    2. Break down job.
    3. Have everything ready.
    4. Have work properly arranged.
  - b. How to instruct.
    1. Prepare worker.
    2. Present operation.
    3. Tryout performance.
    4. Follow-up.

## **C. Special Problems**

### **II. Pharmaceutical Training**

#### **A. Therapeutic and diagnostic agents and professional supplies.**

1. Dispensing.
  - a. Policy.
    1. Pharmacy committee—formulary.
  - b. Types.
    1. Floor stock.
    2. Prescriptions.
    3. Other hospital departments.
  - c. Containers.
  - d. Labels.
  - e. Prepackaging.
  - f. Prevention of waste.
2. Maintaining supply.
  - a. Hospital prepared.
    1. Sterile preparations.
      - a. Heat sterilized.
      - b. Chemically sterilized.
      - c. Aseptically prepared.
        1. Plasma; 2. Allergenic substances.
    2. Non-sterile preparations.
      - a. Pharmaceuticals, tablets, ointments.
      - b. Diagnostic agents.
      - c. Stains.
      - d. Media.
    3. Ready to dispense—purchased.
      1. Tablets and ampoules.
      2. Professional supplies.
        - a. Sutures, needles, syringes, etc.
  3. Storage.
    - a. Temperature.

#### **B. Operation and care of equipment and apparatus.**

#### **C. Checks and controls.**

1. Safety measures.
2. Work sheet.

## **D. Special Problems.**

### **III. Educational Training**

#### **A. Pharmaceutical Growth**

1. Intelligent use of reference books and journals.
2. Attendance at lectures, movies and demonstrations.
3. Scanning all new literature in pharmaceutical and related fields.
4. Learning medical parlance and terminology.
5. Pharmacy conferences.
6. Classification of new medicinals according to a definite outline, name of drug, pharmacological classification, specific action, chemical classification, used for specific disease, dosage, trade name.
7. Use of home organs, leaflets and related material.
8. Field trips, other hospitals, health museum.
9. Membership in, and attendance at societies of the pharmaceutical profession.
10. Special problems.

#### **B. Orientation with other departments**

1. Admitting department.
2. Medical staff.
3. Clinical department. Medicine, surgery, orthopedics, etc.
4. Adjunct diagnostic and therapeutic facilities, clinical laboratory, radiology, physical therapy, etc.
5. Nursing department.
6. Dietary department.
7. Outpatient department.
8. Medical record department.
9. Business and service departments.

#### **C. Teaching**

1. Pharmacology and related subjects.
  - a. Assist instructor to prepare samples and demonstrations for student nurses.
  - b. Compare various textbooks.
2. Methods of teaching.



# Reference Guide

## MANUFACTURING IN THE HOSPITAL PHARMACY

*This subject has been discussed often in the hospital journals, and the titles collected here are presented as the best that have been published. For those with adequate library facilities, these references will suggest a program for reading. The Bacon Library of the American Hospital Association has all the articles listed here available for loan on request.*

*This is one in a series covering some of the perpetual problems of hospital administrators.*

IN ADDITION TO effecting economies of cost and time in the pharmacy, manufacturing offers additional help to the medical staff and increased professional interest and responsibility to the pharmacist. Nor are these advantages confined to larger hospitals.

Two of the articles annotated cite the practicability of manufacturing in the small hospital pharmacy. The literature on the subject has been reviewed with the result that there is very little to contraindicate the practice of manufacturing. To bring to the hospital administrator, the pharmacist and the pharmacy committee of the medical staff the salient points in these articles, is the purpose of the annotations in this section.

"Development and manufacture of pharmaceutical preparations in the hospital pharmacy," Edward D. Davy. *HOSPITALS* 16: 106-108, May 1942.

► Improvement in general pharmacy administration is in part attributable to the increased practice of manufacturing. The author outlines a method of approach and a plan which a hospital may use to install a manufacturing pharmacy. Proper location and equipment and the necessity for close cooperation with the medical staff are emphasized.

"Economy of manufacturing in hospital pharmacy," Ethel Rasmuson. *HOSPITALS* 15: 49-51, May 1941.

► The preparations for which formulas have been developed by the pharmacy in this hospital are listed as well as the formulas themselves for three common items. Economy in manufacturing any pharmaceutical with alcohol as an ingredient is immediately established because it is tax-free for hospital use. For those pharmacists who may hesitate

to compound, and who may feel that their preparations may be inferior, the author suggests a controlled experiment with actual floor use of both purchased drugs and manufactured ones to determine the quality, stability and potency of the preparation he has compounded.

"It pays to manufacture in the hospital," Lawrence Templeton. *Journal of the American Pharmaceutical Association* 4: 362-364, November 1943.

► From the point of view of the medical staff, manufacturing offers a special service to those men who desire to use formulas that do not compare in composition to those supplied by the pharmaceutical concerns; to those who may desire a modification of such formulas; and to those who may wish to work out new formulas with the pharmacist.

"To what extent should hospital pharmacists manufacture?" J. Solon Mordell. *HOSPITALS* 13: 76-78, February 1939.

► Manufacturing, as can most procedures, may lead the pharmacist into a maze of many formulas, not differing radically one from the other. The hospital pharmacist then must plan the extent to which he can economically manufacture, both as to cost of raw materials and time involved. Some preparations, as standard tablets, may be lower in cost to purchase because of the sheer volume of commercial production. This economy would not apply to special formula tablets in small quantities.

"Equipment for manufacturing," H. G. De Kay. *Modern Hospital* 56: 94-96: June 1941.

► In determining the cost of manufactured items the equipment necessary must be taken into account. Depending upon the work the phar-

macy expects to do, the pharmacist would be able to choose the equipment he would require from the check list included in this article.

"Attaining economy in the pharmacy through non-sterile manufacture," Robert A. Kumpf. *HOSPITALS* 20: 102-103, May 1946.

"Organizing the pharmacy for preparation of sterile medications," Ann P. Godley, M.S. and Leo F. Godley, M.S. *HOSPITALS* 20: 76-68, June 1946.

► The two articles discuss the dollar savings to be made, the advantage of consistency in the contents of the solutions made, the importance of having a sufficient quantity always available, the procedure to be followed in the case of sterile medications and the necessity of having an up-to-date library covering the field.

"Manufacturing in the small hospital," Mother M. Immaculata. *HOSPITALS* 13: 81-86, November 1939.

"The function and scope of the pharmacy in a small hospital," J. G. Barclay, Phm.B. *HOSPITALS* 14: 134-136, February 1940.

► Specific instances of actual savings in small hospitals even without additional personnel are quoted in both of these articles. Mother Immaculata comments that hospitals are reverting to the practice of manufacturing which was in use in most hospitals in the earlier days. Mr. Barclay brings out the advantages of less deterioration and a minimum of "shrinkage" through theft.

► The 1937 "Report of the American Hospital Association's Committee on Pharmacy" recommends manufacturing with the statement, "manufacturing is an essential feature of the pharmacy." The late Dr. E. F. Kelly, at that time secretary of the American Pharmaceutical Association, stated for the report that "all drugs, medicines and medical supplies should be manufactured or prepared in the pharmacy so far as is advisable and profitable, depending upon the size and character of the institution." As has been said, much can be saved for even the small hospital by giving careful study to the medication that can be prepared by it. Unless the pharmacist has time for research or has a control laboratory at his command, he should not undertake the manufacture of products that should be analyzed before use.

Index photographed at the  
beginning for the convenience  
of the microfilm user.